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electron user

Vol. 6 No. 4 January 1989 £1.25

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REVIEWS

Pegasus disc interface, By Fair Means or Foul, Play it Again Sam 3, Golden Figurine on test

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GAME

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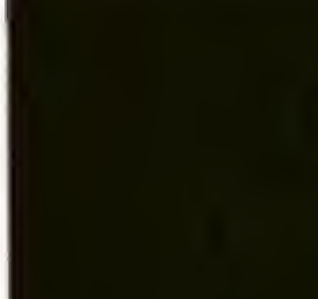
Win a ringside seat at Barry McGuigan's title fight in our easy-to-enter contest

THE LAST NINJA



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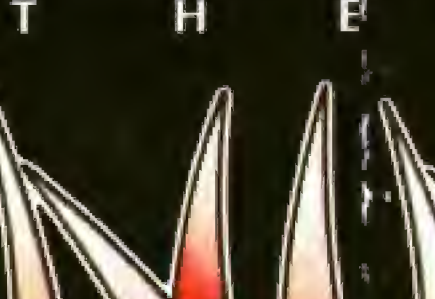

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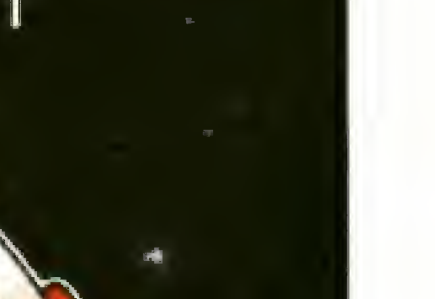

LEVEL 6

THE LAST NINJA ... THE STATE OF THE MARTIAL ARTS

The secrets of the Ninjitsu way had been jealously guarded for centuries, only once every decade were the scrolls seen at the ritual of the White Ninja.

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(The screen pictures show the BBC Micro version of the game.)

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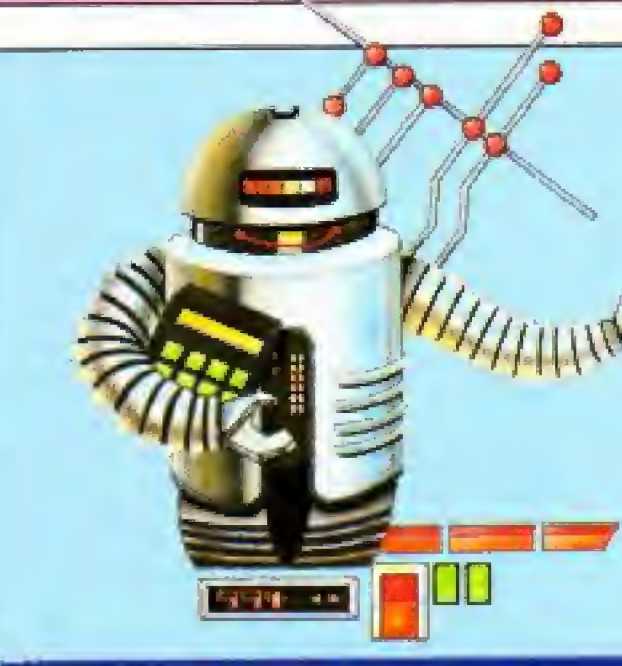
- ***Number jump:*** *Have fun practising tables*



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electron user NEWS

Slogger settles in

AFTER making the long trek from Kent, Slogger is settling into what managing director Andrew Hildig describes as prestigious premises in Bristol.

"Electron users may be aware that we've had problems recently due to the lack of qualified staff following the move", he added. "But I'm pleased to say everything is fine now.

"After lengthy discussions, Project Expansions which was based in Hampshire has joined us to provide a very effective force dedicated to the Electron market.

"This gives us the services of Chris Rudge who was responsible for the four-channel sound and user port cartridge a year ago, and the Pluscom rom.

"Chris has already been helping us produce the Rx Remote Expansion and Plus 2 interface board. We're all settled in now and working well together, which bodes well for the future".

Breakthrough boosts Electron's prospects

AN important breakthrough that promises to extend the useful life of the Electron saw its launch at the Electron & BBC Micro User Show.

Surrey based Pres (0276 72046) featured its Advanced File Manager, described by owner John Huddleston as "the ultimate front end system for disc users". He heralded AFM as "the major software contribution of the show for the Acorn range".

A year of work went into the launch of AFM which runs on the Electron, BBC Micro, BBC Master 128 and Compact with second/co-processors and Acorn compatible versions of DFS and ADFS.

"The most powerful part of Advanced File Manager is its copy routines which allow the user to copy files between different drives – DFS and ADFS – by highlighting filenames on screen", said John.

AFM follows the Pres masterplan of upwards compatibility and it has been allocated a special osword call by Acorn to allow easy access to loading routines.

One of the strongest features of AFM is its two-stage copy routine. With both source and target directories shown on screen the files to be copied are marked and the computer can then be left to get on with it.

Electron specialist Slogger (0272 745244) used the show to highlight its long-awaited Remote Expansion (Rx). This offers a low cost way of upgrading to a 3.5in or 5.25in disc system with add-ons contained in the custom built case.

The Rx comes complete with mains on/off switch and internal power supply and is quite capable of holding the weight of a monitor or TV.

To complement the Rx, Slogger also launched its Plus 2 interface. Fully compatibile with the Rombox Plus and Plus I, it offers two more cartridge slots, three rom sockets, the RS423 interface and user port.

Completing the Slogger showcase were its analogue interface for the Rombox Plus and its joystick interface.

It does not need a Rombox Plus or Plus I unit.

It's a family battle

FATHER and son programming team Ake and Henrik Andersson devised the latest Electron game from CDS Software (0302 21134).

Tankattack is an interactive computer game follow-up to the pair's successful board game. It can involve two, three or four players.

Each player takes the role of a Tank Corps general commanding one or more armoured divisions. The objective is to capture the enemy's headquarters or destroy all his forces by strategic deployment of your weaponry.

Weather, morale, foresight, skill and judgement can all affect the outcome. Careful management of repair facilities also helps, along with a degree of good fortune.

The computer issues all movement orders, results of fire duels, status of each unit and even a daily newspaper, War News, which gives a full report of each day's fighting and the weather prospects for future battles.

"We've taken a great deal of time and made a huge investment to ensure the success of Tankattack", said CDS sales director Martyn Wilson.

Tank Attack authors Ake and Henrik Anderson plan their strategy

FACSIMILE FACILITATED

MICROLINK subscribers have been spared the problems reported by bewildered users of Telecom Gold's new fax service Mailfax.

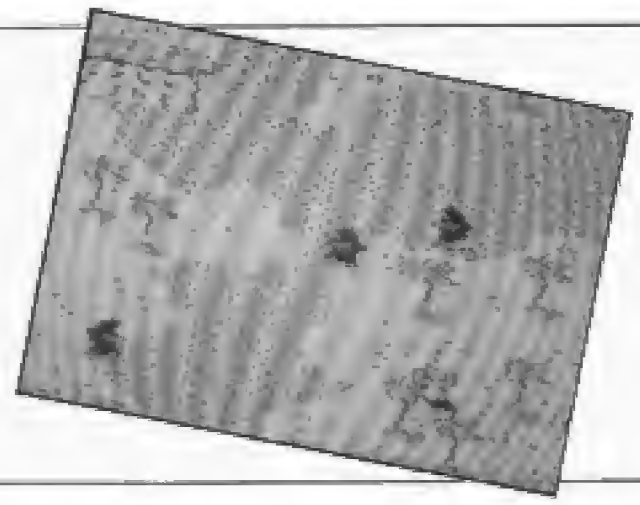
Up to 30 per cent of messages were reportedly being addressed to invalid numbers because users experienced considerable difficulty understanding what to do.

But MicroLink (0625 878888) has come up with a simplified method for using the facility, called Easy Fax.

"People were being asked to key in all sorts of different sequences in order to send fax messages", said MicroLink systems manager Tim Clarkson. "Even I found Mailfax difficult to use.

"But we've re-written the front end of the program for our own subscribers – now all they need do is type in the telephone number of the fax machine they want to send their message to".

Gallup Software Chart



THIS MONTH	LAST MONTH	TITLE (Software House)	COMMENTS	PRICE
1	1	FRANKENSTEIN 2000 *Atlantis*	Still heading the charts. If you enjoy things that bump in the night combined with science fiction like Inner Space this is one for you.	1.99
2	2	SOCCER BOSS *Alternative*	There are not many totally new titles in the charts this month and this has been around for quite a while. Good value though.	1.99
3	•	COMMANDO *Encore*	Highest new entry this month is this repackaged title. Excellent value and one you should buy if you haven't already.	2.99
4	•	JOE BLADE 2 *Players*	The sequel follows close on the heels of the original and is an excellent game in its own right. Well worth buying.	1.99
5	•	JOE BLADE *Players*	Single colour Mode 4 screens and very little sound, but a very enjoyable game which will keep you playing for many hours.	1.99
6	•	PRO GOLF *Atlantis*	Back again, this simulation has good clean graphics and does both the golf enthusiast and budget player proud.	2.99
7	•	GRID IRON *Top Ten*	A quick trip across the Atlantic leaves you with another sport simulation – this time American football with all its associated pitfalls.	2.99
8	•	MONKEY NUTS *Bug Byte*	A new entry from Bug Byte, a name which hasn't been in the charts for a while now. No full-priced games from them though.	1.99
9	•	PLAY IT AGAIN SAM 3 *Superior*	Sam compilations are planned to reach the round dozen this year. The third offering gives you Commando , Palace of Magic, Killer Gorilla I and II.	9.95
10	•	GOLDEN FIGURINE *Atlantis*	A simple but excellent way to discover the puzzles and problems of arcade adventures. Fast-moving and challenging.	1.99
11	•	PLAY IT AGAIN SAM 4 *Superior*	The fourth in the series gives you Frak, the new Cosmic Camouflage, Guardian and Spellbinder to come to grips with.	9.95
12	•	CHUCKIE EGG *A & F*	Cast your mind back and you will remember the egg shaped fiend in his toil through this platform and ladders game.	9.95
13	•	FOOTBALLER OF THE YEAR *Gremlin*	Football games seem to retain their popularity and this full priced offering, first released several years ago, is no exception.	9.95
14	7	REPTON THROUGH TIME *Superior*	A must for ardent Repton fans. As you would expect, there are plenty of puzzles from the prehistoric to the modern.	9.95
15	4	COMBAT LYNX *Alternative*	This wartime helicopter simulation sets a mission for the adventurous. A good introduction to the world of flight simulators.	1.99
16	•	FLIGHT PATH 737 *Anco*	Another airborne offering, this time aboard a commercial liner. A different type of simulation with a new set of considerations.	2.99
17	11	GOLF *Blue Ribbon*	Not one to help with your swing perhaps, but it is still reasonably absorbing and requires a certain amount of skill.	1.99
18	•	REPTON 3 *Superior*	There is little else to be said about Repton – this is a superb series of games that all Electron users should have.	9.95
19	14	DARTS *Blue Ribbon*	Three different games to choose from: 501 and Cricket are the most worthwhile. Simple graphics and little sound.	1.99
20	•	AROUND THE WORLD IN 40 SCREENS *Superior*	Repton Infinity is about to make its debut, but you can take your green friend on a tour via the Oceans and the Arctic in the meantime.	6.95

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Yet more good port

Joe Pritchard continues development of the input/output port

WE built the output port for the Electron in the October 1988 issue, so this month we'll construct the input port – a simple matter of adding a further chip to the board we constructed last time and making a few extra connections.

Figure I shows the circuit diagram of the input port. The logic gates shown as IC1c, IC2c and IC2d are unused portions of the gates we used last time to generate the select signal for the project's output section. To generate a select signal for the input section, we need to have a signal present when a read is being attempted from any address in Page &FD.

These three gates generate this signal and apply it to the input buffer, IC4. This is a 74LS245 chip, a rather special device called a tri-state buffer. We can't just connect the I0 to I7 input lines to the data bus of the computer as this would cause the machine to crash. The reason is that the signals put on to the data bus by the input lines would conflict with data bytes that the CPU is trying to read from memory.

In microprocessor circuits, it is crucial that at any one instant only one device, be it an address in memory or a peripheral, is trying to make a byte available to the CPU. For this reason, when an input device is connected to the data bus it is connected through a tri-state buffer. When this buffer is not selected by a select signal, it's as if the input device doesn't exist as far as the CPU is concerned.

CPU in the dark

In our case, when the 245 chip isn't selected the signals on the I0 to I7 lines are not passed on to the data bus and the CPU is oblivious to the presence of whatever devices we have got connected to I0, I1, and so on. However, as soon as the device is selected, these signals are passed on to the data bus to be read by the CPU.

Each input line, I0 to I7, is connected to 0V by a 1k resistor. This pull down resistor, forces the input lines to assume a logic zero in the absence of any input signal. If these resistors are omitted, the input lines will float at a voltage level that depends to a great extent on the particular 245 chip.

The practical result is that the value read from an unconnected input signal may fluctuate between logic zero and one at random. Not very desirable. I had one such circuit that fluctuated when I touched the input lead with my finger. The pull downs force uncommitted inputs to assume a logic zero.

Figure II shows the additional construction information needed. It shows the connections needed to get the input circuit working, but doesn't include the connections shown last time for the output circuit. No further connections are needed to the edge connector.

Don't forget to connect a 1k (1/8 or 1/4 watt) resistor between each of the input lines and 0V – only one such resistor is shown on the diagram for clarity. Note that these resistors are connected to the input lines of the 245 chip, not the data lines of the Plus 1.

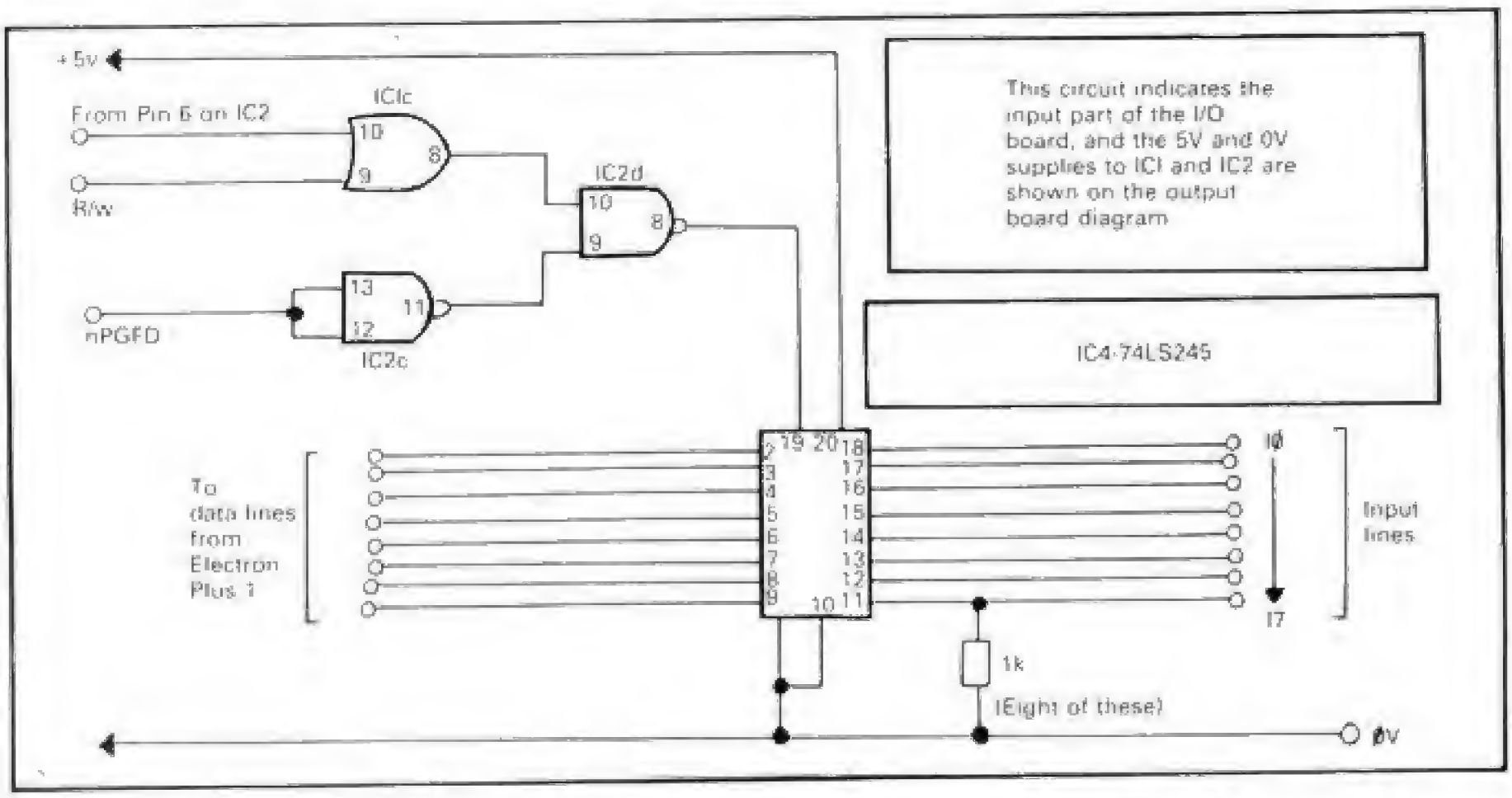
The veropins marked Input are for incoming electrical signals. For now, solder a piece of flexible wire to the 5V line and bare the other end. We will use this to test the input port.

Testing, testing

Check all the wiring carefully, especially that to the Plus 1 data lines. Make sure that there are no blobs of solder or whiskers of wire between veroboard tracks. Turn the Electron off, remove or turn off any peripherals that use Page &FD and then insert the edge connector into the cartridge slot nearest to the keyboard, taking care to get it the right way around.

Now turn on the Electron on. If the normal start up message does not appear within a second or so turn off immediately. If the start up message doesn't come up, unplug the edge connector (there's enough room to get a grip on the edge connector without yanking it out by the ribbon cable) and check the wiring.

Once a start up message has appeared, type in



The input part of the I/O board

Program 1 and run it:

```
10 REPEAT
20 PRINTTAB(10,10);?&FC00;"
30 UNTIL FALSE
```

Momentarily connect each of the input pins to 5V with the flexible lead you soldered to the 5V line. You should see the number displayed change each time, as like this:

Input connected to 0V	Display
None connected	0
ID7	128
ID6	64
ID5	32
ID4	16
ID3	8
ID2	4
ID1	2
ID0	1

Remember that these are the input veropins, not the pins connected to the ribbon cable and hence to the cartridge slot data lines. Those pins should never be connected directly to 0V – it would crash the Electron and could possibly damage it.

Should this test work, congratulations, you've got the input port working. Now we can finish it off. The circuit can be boxed up in a plastic case available from such companies as Tandy and Rapid Electronics.

A slot can be cut in the side for the ribbon cable, and the cable should be stuck to the inside of the box with epoxy resin to prevent it being yanked off the circuit board.

Making the terminals

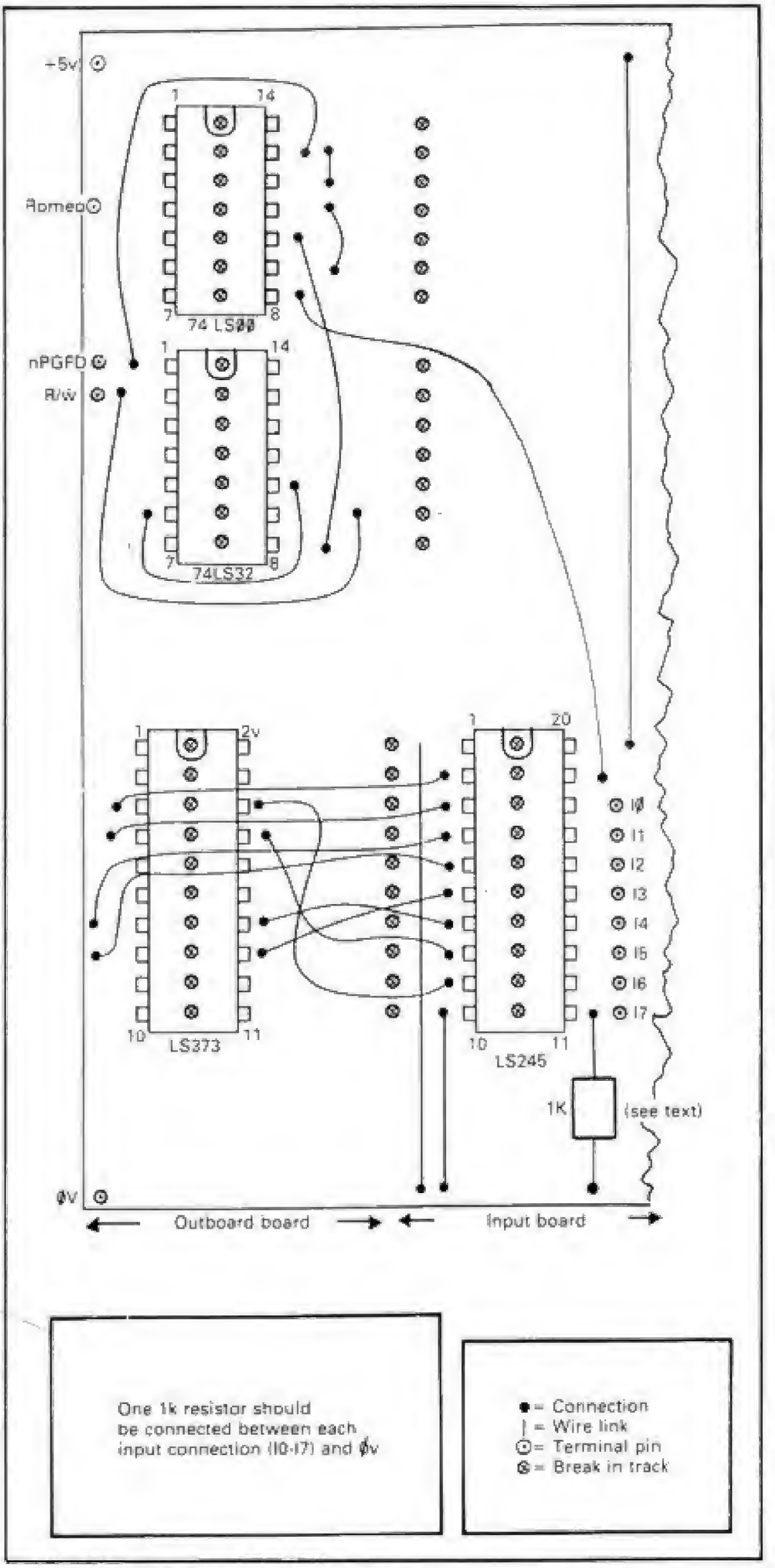
I used a big lump of Blue Tack to stick the board to the bottom of the box. The output, input and 0V lines can then be taken to some terminals on the front or top of the box. Here are two suggestions:

4mm screw terminals: These are available from Rapid Electronics and you will need nine of them. You could used red ones for output, green for input and a black one for the 0V line. These can be fixed to the top of the box by drilling a couple of rows of holes for the screws of the terminals, and then pushing a terminal in to each hole and tightening up the supplied nut.

The connections to the circuit can then be made with flexible copper wire, soldering the wire to the metal pin of the screw terminals.

Terminal blocks: A couple of three amp screw terminal blocks, available from electrical shops, can be used, with the wires from the circuit board screwed into one side of the block and the other side being left for your connections. The blocks can be secured to the lid of the plastic box using small nuts and bolts.

● *Next month we'll look at the basic use of the port, and examine how a variety of devices can be connected to it. We'll also start on some projects that will make use of this or any other 8 bit I/O port.*



Adding components to the output board to make the input board

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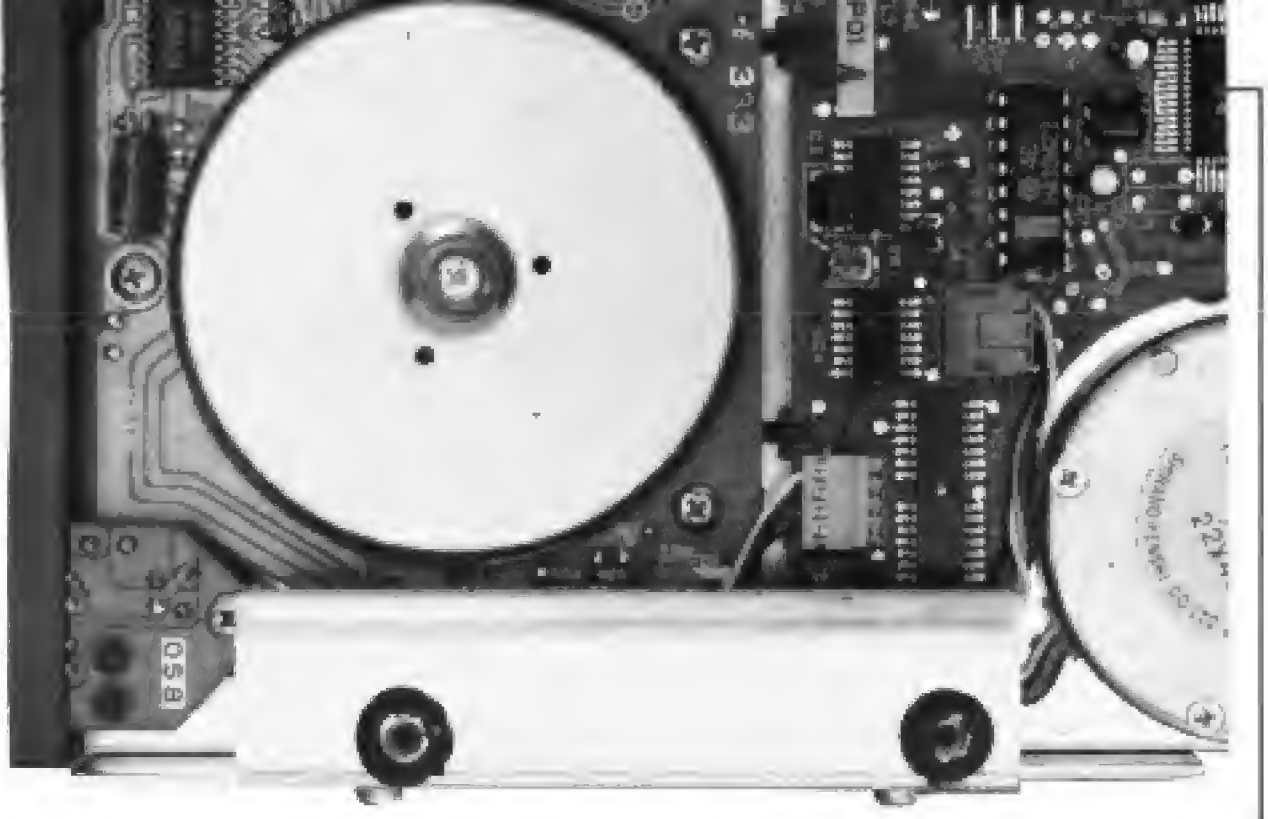

Disc wipe-out

In Part 3 of his floppy disc series Roland Waddilove invites you to add an extra *WIPE command to your ADFS

THE advanced disc filing system used in the Acorn Plus 3 and Pres AP3 has an excellent range of commands for loading, saving and deleting files on disc, plus a whole host of sundry general housekeeping utilities. On the whole, it is a far more flexible and much improved filing system than its predecessor the DFS.

There is, however, one area where the old DFS still wins hands down, and that's when it comes to deleting files. The most commonly used DFS command for erasing a file is *WIPE. This prints the name of each file on the screen and prompts for Y or N to indicate whether you want that particular file deleted.

The ADFS alternatives are either *DELETE or *DESTROY. Erasing several files in one go can be frustrating, as the former command will only delete a single file, and the latter, although it will accept wildcards, often can't be used as the filenames are too similar.

For instance, try erasing the following three programs without touching *Prog2*:

```
Prog1
Prog3
Prog4
```

You must type in three separate *DELETE commands like:

```
*DELETE Prog1
*DELETE Prog3
*DELETE Prog4
```

You can't use *DESTROY, as:

```
*DESTROY Prog*
```

would also erase *Prog2* as well as it also fits the wildcard specification. DFS users however, would simply type:

```
*WIPE Prog*
```

and press N when prompted to delete *Prog2*.

The utility presented here adds an extra command to the ADFS which emulates the DFS' *WIPE facility. (It will also work with the DFS, but as there's already a built-in command that does exactly the same job there's not much point in using this program!.

There are two versions, a Basic and a machine code listing. The two programs are identical apart from the language they are written in. Enter and save Program I, the Basic version. Using it couldn't be easier – just chain it or load and run it. Each file in the currently selected directory will be printed on the screen and you have the opportunity to press Y or N to indicate whether you want it to be deleted.

Program II creates an identical machine code version which is automatically saved to disc with the filename WIPE. Save the assembly language source code program as well, but under a different name. With this version you just type *WIPE to call it up.

The advantage over the Basic listing is that it won't affect any program in memory, in fact you don't even need to be in Basic to use it. For instance, try it from View's command screen, or while Lisp programming.

It works by making use of yet another operating system call only available to disc users – *osgbpb*, which is located at &FFD1 in the os rom. Like the *osfile* routines that we looked at last month, this single call is able to perform quite a wide variety of functions.

The one we are interested in is *osgbpb* with the A register set to eight, which enables us to read the directory off a disc. This contains a list of all the files present, so once we have this information we can display each one and delete it if requested.

The routine makes use of the parameter block shown in Table I, and this must be set up before it is called. The first byte, which holds the currently selected directory's master sequence number, isn't of interest to us. Bytes one to four hold the address of a buffer where data is to be transferred to, and bytes 9 to 12 are used by *osgbpb* as a pointer into the directory.

At the start of the WIPE utility – line 70 in the Basic listing – the directory pointer at byte nine is set to zero so that the routine starts reading the directory from the beginning. The address of the buffer is stored at byte one and the number of files to read is also set to one. The operating system is then called with the X and Y registers holding the address of the parameter block.

A single file is read from the directory and its name is displayed on the screen by copying it from the buffer. (The first byte, by the way, tells you how long the filename is.) The program then waits for you to press Y or N, and if you press Y a

Turn to Page 12 ►

```
>*CAT                    (36)
Utilities Disc           Option 00 (Off )
Drive:0                  Lib. "Unset"
Dir. $
                                 WR (36)
DataFile      WR (33)    Invaders WR (35)
M-WIPE        WR (28)    SCR0     WR (30)
SpreadSht     WR (32)    WIPE
ZYSysHelp     L  (01)
>
>*WIPE
DataFile      :N
Invaders      :Y
M-WIPE        :Y
SCR0          :N
SpreadSht     :N
WIPE          :N
ZYSysHelp     :N
>
```

Byte	Use
0	Unimportant
1	Pointer to memory area to transfer data to
5	Number of filenames to read
9	Pointer into the directory

Table I: The osgbpb parameter block

```
   10 REM ADFS *WIPE command
   20 REM By R.N.Waddilove
   30 REM (c) Electron User
   40 DIM block 13
   50 DIM buffer 31
   60 osgbpb=&FFD1
   70 block!9=0
   80 REPEAT
   90 T%=block!9
  100 block!1=buffer
  110 block!5=1
  120 A%=8
  130 X%=block MOD 256
  140 Y%=block DIV 256
  150 CALL osgbpb
  160 IF block?5<>1 PROCdelete
  170 UNTIL block?5=1
  180 END
  190
  200 DEF PROCdelete
  210 file$=""
  220 FOR i=1 TO ?buffer
  230 file$=file$+CHR$(buffer?i)
  240 NEXT
  250 PRINT file$;":";
  260 key%=GET AND &DF
  270 IF key%=ASC"Y" PRINT "Y":OSCLI"D
ELETE "+file$:block!9=T% ELSE PRINT"N"
  280 ENDPROC
```

Program I

◀ *From Page 11*

*DELETE is executed using the OSCLI command. The next filename is read and the process is repeated.

Fundamentally, it is a straightforward program which repeatedly reads a single filename and deletes it if requested until there are no more. You can tell when this is by checking the one stored at byte five of the *osgbpb* parameter block. If this remains a one there are no more files to read, otherwise it is altered by the call.

One other point to watch out for is that when a file is deleted the remaining filenames in the directory are shuffled up to fill the gap. This means that the pointer into the directory – which is automatically incremented for you every time *osgbpb* is called – must be restored to the previous value, or the next file will be skipped.

One enhancement you may like to attempt is to replace the OSCLI command in the machine code version with the *osfile* call to delete a file which was demonstrated in last month's article.

● *And with that little poser, I'll leave you till next month where I'll be examining some of the other powerful* osgbpb *functions available to the disc drive owner.*

```
 10 REM ADFS *Wipe command
 20 REM By A.A.Waddilove
 30 REM (c) Electron User
 40 osgbpb=&FFD1
 50 osasci=&FFE3
 60 oscli=&FFF7
 70 FOR pass=0 TO 2 STEP 2
 80 P%=&900
 90 [ OPT pass
100 .loop
110 LDA block+9 :STA temp
120 LDA block+10:STA temp+1
130 LDA #buffer MOD 256
140 STA block+1
150 LDA #buffer DIV 256
160 STA block+2
170 LDA #1
180 STA block+5
190 LDA #8
200 LDX #block MOD 256
210 LDY #block DIV 256
220 JSR osgbpb   \read directory
230 LDA #1
240 CMP block+5  \file to delete?
250 BNE delete
260 RTS
270
280 .delete
290 LDY #1
300 .loop1
310 LDA buffer,Y
320 STA string+6,Y  \copy name
330 JSR osasci      \print name
340 INY
350 DEC buffer
360 BNE loop1    \more characters?
370 LDA #ASC":"
380 JSR osasci
390 LDA #&0D
400 STA string+7,Y
410 JSR &FFE0       \GET character
420 AND #&DF
430 CMP #ASC"Y"     \pressed Y?
440 BNE skip
450 LDX #string MOD 256
460 LDY #string DIV 256
470 JSR oscli       \*DELETE file
480 LDA temp:STA block+9
490 LDA temp+1:STA block+10
500 LDA #ASC"Y"
510 JMP exit
520 .skip
530 LDA #ASC"N"
540 .exit
550 JSR osasci
560 LDA #&0D        \CR/LF
570 JSR osasci
580 JMP loop
590
600 \temp store for file counter
610 .temp
620 EQUW 0
630
640 .block
650 EQUB 0  \not important
660 EQUD 0  \buffer address
670 EQUD 0  \files to read
680 EQUD 0  \file counter
690
700 \11 byte filename buffer
710 .buffer
720 EQUS "***********"
730
740 \OSCLI string
750 .string
760 EQUS "DELETE **********"
770 ]
780 NEXT
790
800 a$="SAVE WIPE 900 "+STR$~P%
810 PRINT "*";a$
820 OSCLI a$
830 PRINT "Done..."
```

Program 1

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THE SAM 3 compilation includes two games that did not originate in the Superior stable – Elite's Commando and Micro Power's Killer Gorilla. Commando is the officially licensed home computer version of the arcade machine game of the same name. For the information of anyone who has not been in an amusement arcade in the last few years, or who missed the game on its initial release for the Electron, Commando is another of the one-man-against-the-odds combat games that have become so popular in recent years.

You are Super Joe, the commando of the title. Armed only with a submachine gun and half a dozen grenades, you must penetrate the enemy defences and destroy the fortress. Easy to describe, but of course, much less easy to do.

Commando features a number of different screens. Once you have fought your way from the bottom of one screen to the top it scrolls down to reveal new hazards. You thus get the impression of fighting one continuous battle.

Every new screen brings a fresh horde of enemy soldiers streaming from all quarters. Your machine gun makes short work of them, and your grenades come in handy when their numbers become too great, but remember that they are equipped with similar weapons. One stray bullet or grenade can prove fatal, so keep a sharp eye about you.

This re-released Commando incorporates one key improvement. When playing the original game you sometimes could not determine from the screen display when you had been killed. Now there is no doubt. A blinding white flash heralds your call-up to the ranks of the ex-commandos.

Commando

I have never been particularly impressed by Commando. Its main drawback is that it comes off very badly from the dilemma that faces every programmer – weighing up the pros and cons of each screen mode and the conflicting features of screen resolution, screen size and available number of colours.

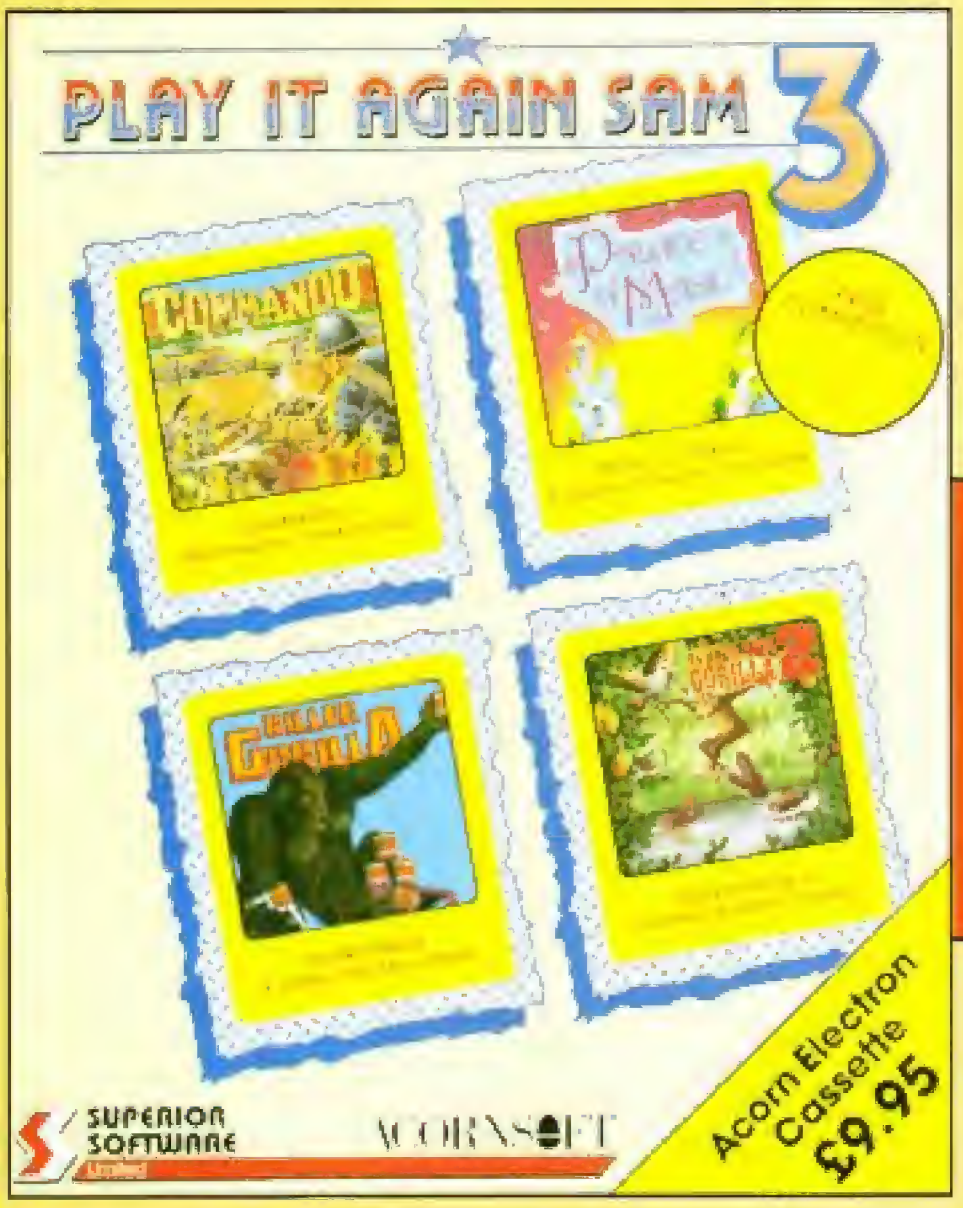
Commando runs in Mode 5 which allows only four colours on screen at any one time. I found that many graphic features tended to merge into one another. Nevertheless, if you're a fan of shoot anything that moves games you could do worse than pick this one.

Killer Gorilla will need little introduction to the majority of Electron owners. It is an excellent implementation of the ever-popular arcade machine game Donkey Kong. Although it was released in the relatively early days of the Electron, I have never seen another version that surpasses it in quality and playability. When an officially licensed version did the rounds of the popular home computers a few years ago I was interested to see that no Electron version ever appeared – Killer Gorilla got it right first time.

The game was inspired by the 1933 film King Kong. You play the part of Mario, a humble carpenter whose girlfriend the evil Kong has carried off to the top of an unsteady tower of scaffolding. You have to climb it to rescue her.

You scale each section of scaffolding, avoiding the barrels that Kong throws in an attempt to dislodge you. Unfortunately, these barrels are by no means your only problems – fireballs and custard pies also threaten to send you to a sticky end.

However, help is at hand. Large hammers hang above your head at intervals. Jump up and grab one and you can destroy any moving hazard that comes within reach. However, their effectiveness quickly wears off, often at fatally inconvenient moments. Moreover, Kong will not willingly surrender your lady; just as you catch up with him at the top of one section he whisks her up to the next.



Blast from the past

Program: Play It Again Sam 3
Price: £9.95 (tape)
Supplier: Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX.
Tel: 0532 459453

The game features four screens, each more difficult than the last. The first is a straight climb from the bottom to the top of the screen, the second introduces conveyer belts that keep changing direction. The third features lifts made of pieces of girder, and bouncing girders that can quickly cut down an inattentive carpenter.

The fourth and last screen looks perfectly straightforward, but is rapidly overrun with deadly fireballs. However, the screen also includes two hammers, and if you can reach them in time they will make short work of your fiery adversaries.

After you have completed this level and defeated the gorilla, you return to the first screen to find that things have changed, for the worse. The first screen now features gaps in the framework of girders – and you have to jump for your life. The conveyers on screen two move more quickly than before, as do the lifts on screen three. In all, the game has 15 increasingly difficult levels, enough to test even the most ardent hero. Killer Gorilla is a classic game that still provides hours of amusement.

Just as Killer Gorilla is an implementation of the arcade machine game Donkey Kong, Killer Gorilla II is a version of the arcade follow-up, Donkey Kong Junior. Older players may remember the game's original release, under the name of Zany Kong Junior. Unfortunately, that release had to be withdrawn for copyright reasons – I suspect that it was too good a copy of the arcade original.

In Killer Gorilla II the roles have been reversed. Mario – now called Morris – has defeated Kong and rescued his girlfriend; however, in an act of revenge he has captured Kong. You, Kong Junior, must rescue your elder.

As in Killer Gorilla Mark 1, you must make your way from the bottom to the top of successive screens, but there the similarity ends. You start off in the jungle, and manoeuvre yourself around a network of platforms, vines and creepers, to the top of the screen where your caged parent sits helplessly. However, no sooner do you reach the brutal Morris and the cage than they are gone. The chase is on.

Like its predecessor, Killer Gorilla II features four different screens that repeat with increased difficulty. Unlike the original, the four screens don't follow a consistent theme. The first requires you to swing around a network of vines bridged by brick platforms.

Killer Gorilla

Unfortunately, as usual, the screen is far from deserted. You soon discover that a number of disembodied snapping heads are travelling up and down the vines at great speed and doing their best to find out what baby gorilla tastes like. A single bite is fatal.

Pieces of fruit hang from the vines at regular intervals. You can buy time for yourself and for your cause by dislodging them at opportune moments and crushing any hapless creature that may be underneath.

The second screen is totally different: the only way to reach the trailing chains way out of reach above your head is to bounce on a spring just in front of you. That obstacle cleared, you must now contend with a stream of giant parrots that home in on you relentlessly. Luckily there are a couple of usefully placed pieces of fruit to hand.

The third screen depicts the generator room where you scramble along electrical cables, avoiding the high voltage sparks that race around the circuit. This screen can be very difficult for so many sparks are speeding in different directions that even a small gorilla cannot evade them for long.

When you reach the fourth screen you look up to see Kong Senior's cage sitting on a girder high above your head where it is held in place by six ropes locked to the girder. The six keys are attached to chains hanging from the girder.

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Killer Gorilla II

SecondOpinion

The SAM series of compilations are simply superb value for money. The games were rated very highly when originally released and the quality is top notch. They provide endless hours of enjoyment for all the family.

The only problem with it (and this goes for all compilations) is that you may already have one or more of the games. However, even if you have two originals, the other two games still work out at under a fiver each which can't be bad.

Janice Murray

◄ From Page 15

Collect all six to release your parent.

You must now contend with both the snapping heads from the first screen and the giant parrots from screen two. As in Killer Gorilla I, once you have completed this screen, you are returned to a more difficult screen one to perform your feats of heroism all over again.

I found Killer Gorilla II much more difficult than its namesake, but it certainly adds a bit of variety to a well-established formula.

The last title in the collection is Palace of Magic, an arcade-adventure with more than 100 screens: it is very similar in appearance to Superior Software's classic Citadel. Palace of Magic does not attempt to disguise the source of its inspiration – quite the reverse in fact. The plot of the game is that you have offended the evil wizard Caldeti – try rearranging the letters and see what comes out – who has shrunk you to the size of a dwarf and imprisoned you in the Palace of Magic. Your escape will not be easy.

As in Citadel, you have but one life and only a limited amount of energy. This is depleted whenever you spend too long under water or when you come into contact with any flames or any of the Palace's animated inhabitants. You can, however, replenish your energy by collecting magical top hats dotted around and about.

I have heard that the more awkwardly-placed hats give greater rewards, but this may be nothing more than a rumour. One point worth noting is that your energy level cannot be increased beyond its initial level. Do not pick up a top hat until you really need it, or you will waste some of its magic.

Like Citadel, Palace of Magic features a number of adventure-style puzzles to be solved in the correct order before you can get into some of the more remote areas of the Palace and surrounding landscape.

For example, you may find that your path is blocked by a blue and cyan door. Before you can progress any further you will need to find a blue and cyan key. Of course, you may need to solve other puzzles before you can get to the key. What must you give to the vicar before he will let you into the chapel? Who can you bribe with the gold bar? It is essential to plan ahead. As with any adventure, drawing a map will help.

If you like games that require a combination of logical thought and manual dexterity, Palace of Magic will provide a considerable test of both skills.

Martin Reed

Sound	9
Graphics	9
Playability	9
Value for money	9
Overall	9

Beware the deadly trap

Product: The Golden Figurine
Price: £1.99 (tape)
Supplier: Atlantis Software, 28 Station Road, London SE25 5AG.
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TAKE a portion of Citadel and mix it with a touch of Jet Set Willy and you end up with the latest, budget priced arcade adventure from Atlantis Software. The rules are simple. Your aim is to recover the golden figurine, a family heirloom which has been stolen by the evil wizard Morthond. The game controls are left, right and jump, and these suffice to get you around the 57 rooms of the wizard's castle, picking up and using objects as you go.

The castle is populated by Morthond's mutant servants. Bumping into them will reduce your strength, as will collisions with spikes or water. Your strength can be replenished by eating the food left scattered around. Nice for mice.

If you can keep up your strength you will have to cope with the problem-solving parts of the game. Without giving too much away, you will need to find something hot to melt the snowman that blocks your path, and don't try to use a boat while it has a leaky hull – mend it first. The trampoline will have a number of uses, but great care will be needed to do things in the correct order.

Experienced arcade adventurers will not find these puzzles too much to cope with – in fact they could be an ideal introduction for the novice. The skilful timing needed to prevent loss of strength presents much more of a problem, because your character has incredibly fast movement. This leads to the one major difficulty.

There are many places where one false move topples you into a pit from which there is no escape. Death comes quickly in these cases, and I would have liked a Citadel-like routine which moves you to comparative safety. To get the *You have failed in your quest* message after a long session of adventuring is a bit too frustrating.

Despite that criticism, Golden Figurine is addictive and fun to play. It is well worth getting for your Christmas stocking.

Rog Frost

Graphics	8
Sound	7
Playability	9
Value for money	10
Overall	9

SecondOpinion

Atlantis is well known for its budget titles, and among them are some real gems. This Citadel/Palace of Magic clone could have been another, but just misses that accolade by being too difficult. The problem is that it's far too easy to get stuck in a deadly trap with no hope of getting out – just one slip and your goose is cooked. You then have to return to the beginning and start all over again.

If you like a challenge, have nerves of steel and lightning reactions look out for this enjoyable, but frustrating arcade adventure.

Janice Murray

CLOGGER - The State of The Art

In a strange and mystical land, many years ago, lived a peaceful race of beings known as the Cloggers. Cloggers were unusual creatures with 3 feet and no head but with strange powers that enable them to perceive their environment in a way that is incomprehensible to man.

Cloggers also have a great love of art and in order to achieve the status of Master Clogger must prove their artistic appreciation. To do this all young Cloggers must undertake a series of cunningly conceived tests. These consist of reassembling various pieces of artwork which are scattered around dangerous landscapes in the hidden valleys of Clogland.

Few Cloggers ever reach the status of Master Clogger. The task is truly awesome with countless problems to be solved and pitfalls to overcome. The time taken to complete each landscape is also critical but the powers that be have kindly left a little extra food. However this should be eaten with moderation as guzzling it down can lose some of its energy value.

Each of the 18 landscapes becomes progressively more complex with increasing numbers of individual tests of initiative.

There are drills to be found which can be used (sparingly!) to create essential passageways; powerful lawnmowers to clear the deadly Cloggrass; plus springs, rebounding gyroscopes and buffers which all hinder your progress.

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(BLOCK CAPITALS PLEASE)

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Program: By Fair Means or Foul
Price: £8.95 (tape)
Supplier: Superior Software, Regent House, Skinner Lane, Leeds LS7 1AX
Tel: 0532 459453

It's a knockout

IN spite of its rather peculiar title, By Fair Means Or Foul (BFMOF) is in fact a boxing game in the mould of Tynesoft's The Big KO. I first became aware of the game's development well over a year ago, and I was just about to consign it to legend when it dropped through my letterbox.

Like The Big KO and the various karate games that have appeared on the Electron, BFMOF allows you to execute a variety of boxing moves. These include a body blow, uppercut, standard punch and duck punch – all perfectly legal manoeuvres. You can also move backwards and forwards and block your opponent's blows by engaging either a high guard or a low guard. These are the fair moves. You can however, also execute four foul moves – head butt, knee, kick and groin punch – hence the name of the game.

Like any boxing match, the fights are supervised by a referee who will try to ensure a good clean fight. However, there are times when his attention wanders, so if you want to play dirty, strike quickly.

The probability of executing a foul move without attracting the referee's attention is indicated by the colour of a box below your score. If it is red you will certainly be spotted, and red/white indicates that you stand a reasonable chance of getting away with it. A white silhouette gives the all clear to any dirty move.

The referee's attention is constantly changing, so he may be watching one competitor with an eagle eye while the other may be able to execute all kinds of ungentlemanly moves. You start off with five lives and will lose one if you are caught attempting an illegal move.

Each player – you can square up to another human or the computer – has an energy level which falls every time your opponent lands a punch. When it reaches zero you lose a life. Fortunately, your energy builds up gradually, but you will have difficulty in avoiding your opponent for any length of time. Your energy is restored to maximum at the end of each round, so you can sometimes hang on long enough to fight another day.

Rounds are one minute long, and the time can seem to go very quickly if you are losing. If neither player manages a knockout, the one with the higher energy level at the end of the round is the winner. The defeated player loses a life.

If you manage to defeat your opponent five times you go on to fight for a more imposing title against a tougher adversary. Needless to say, the game will come to an end if you lose your lives first.

Like author Michael Simpson's other game, Way of the Exploding Fist, BFMOF pits you against a number of increasingly skilful and vicious opponents. Your first only knows a few moves and is a fairly clean fighter. Later ones can call on a wider range of skills and manoeuvres and do not hesitate to use them.

The ring scene graphics are not particularly impressive, and the game seems rather devoid of colour – a stark contrast to Exploding Fist. However, the animation of the two boxers is very lifelike, as they swing their arms and jump around on their toes.

The crowd certainly believes in audience participation. If you manage to land a punch, a little "Get him!" or "Again!" speech bubble appears in the air behind you. If you manage to win a round, your fans go wild and celebrate with a deafening roar.

However, they are not particularly patient, and will soon start to shout "Chicken!" if you are seen to be avoiding the action. The referee is a little more subtle – he just goes to sleep. Above all, the audience likes to see clean fighting, and if you or your opponent stoop to ungentlemanly tactics, the audience will soon voice its disapproval by booing the offender.

The players can be controlled using either the keyboard or joysticks, and the controls can be selected individually – one player can use the keyboard and the other a joystick.

You can switch the sound on or off at will, and if you don't like the crowd encouraging or booing you, simply turn them off as well. The game features a demonstration mode that can give you a good idea of strategy and gameplay. Watch it closely.

By Fair Means or Foul is the result of a well-used idea approached from a different direction and, as such, has been implemented well.

Martin Reed

SecondOpinion

I'm not one to stop up till three o'clock in the morning just to see Mike Tyson slogging it out with some other prizefighter, however, I did quite enjoy this computer conversion of the popular blood sport.

The graphics are quite good, though they certainly aren't the best I've seen. The animation is reasonably fast and the sound is OK. Overall, a competent arcade combat game that deserves to do well.

Janice Murray

Sound	*6*
Graphics	*7*
Playability	*8*
Value for money	*8*
Overall	*8*

Planning for the future

Roland Waddilove presents a program to help in calculating your retirement fund

OLD age and retirement is a part of our life that we don't normally consider, especially when we are still young, fit and healthy. However, as it draws closer many people often wish they had planned for the future a little better, and this utility is designed to be used as a helpful guide when you decide how much money to put aside for your retirement.

Enter and save the program, then run it and answer the questions put to you. First you'll be asked to input your age, followed by your retirement age, how much a month you want to receive when you retire, and how long the lump sum saved should last. Finally, enter the rate of interest provided by the bank or building society.

The program will perform a few calculations, and then tell you how much you need to invest now to enable you to withdraw the specified amount each month when you retire.

It is interesting to experiment with a few "What if...?" questions. For instance, suppose you wanted to receive £1,000 a month for 15 years when you retire.

An 18-year-old would have to invest a lump sum of £1,075 now, providing a retirement fund of £94,812 when he retires.

Most interesting is that you would only need to put £200 in a building society at 10 per cent interest for your new-born son to receive £1,000 a month when he retires.

Also, try entering different interest rates and note the large difference in the lump sum required for investment.

The retirement fund is found by calculating the compound interest on the lump sum invested using the formula:

```
F=P*(1+i)^n
```

where *F* is the final amount, *P* the initial investment, *i* the interest rate and *n* the number of years invested.

The investment required for a given withdrawal is given by:

```
P=(R*n/i)*(1-(1/(1+i/n)^(n*y)))
```

where *P* is the initial amount required, *R* is the regular withdrawal, *n* the number of withdrawals per year, *y* the number of years and *i* the rate of interest.

```
  10 t$="Retirement Fund Calculator"
  20 REM By R.A.Waddilove
  30 REM (c) Electron User
  40 MODE 7
  50 VDU 19,1,6;0;
  60 PRINT TAB(0,1)t$;TAB(0,2)STRING$
(27,"-")
  70 COLOUR 2
  80 PRINT TAB(0,5);
  90 INPUT "How old are you ";age
 100 INPUT '"What age will you retir
e";retire
 110 PRINT '"How much do you want to
 withdraw"
 120 INPUT "per month when you retire
 £"withdraw
 130 INPUT '"For how many years ";ye
ars
 140 INPUT '"Rate of interest %"inte
rest
 150 interest=interest/100
 160 COLOUR 3
 170 PRINT '"Calculating..."
 180 capital=(withdraw*12/interest)*(
1-(1/(1+interest/12)^(12*years)))
 190 investment=0
 200 REPEAT
 210 investment=investment+25
 220 fund=investment*(1+interest)^(re
tire-age)
 230 UNTIL fund>capital
 240 COLOUR 1
 250 PRINT '"An investment of £";FNm
oney(investment);" now will"
 260 PRINT "give you a retirement fun
d of £";FNmoney(fund)
 270 PRINT '"Then you'll be able to
withdraw"
 280 PRINT "£";FNmoney(withdraw);" pe
r month for ";years;" years"
 290 PRINT
 300 END
 310
 320 DEF FNmoney(pounds)
 330 m$=STR$(INT(pounds))
 340 p$=""
 350 REPEAT
 360 IF LEN(m$)>3 p$=","+RIGHT$(m$,3)
+p$:m$=LEFT$(m$,LEN(m$)-3)
 370 UNTIL LEN(m$)<4
 380 =m$+p$
```

```
Retirement Fund Calculator

How old are you ?31
What age will you retire?65
How much do you want to withdraw
per month when you retire £1000
For how many years ?15
Rate of interest %8.25
Calculating...
An investment of £6,975 now will
give you a retirement fund of £103,298
Then you'll be able to withdraw
£1,000 per month for 15 years
```

VARIABLES

t$	The title
age	Your age
retire	Your retirement age
withdraw	Your monthly withdrawal
years	Number of years fund is to last
interest	The interest rate

Here's how you can get the very best out of your Electron

Within the pages of these three books you'll find ALL the information you need to fully harness the power of your Electron. They cover Basic, machine-code programming and the operating system, and between them they also show how to combine all three to create more powerful and effective programs.

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Tallest:	Spot the highest flower an exercise in visual perception.

and much, much more...

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Right answers bring a Cheshire Cat grinning from the screen, who quickly steps in to help the child in difficulty.

Cheshire Cat **ADDER SUMS** includes:-

Multiplication:	Calculate the cost of items shown in the grocer's shop window.
Addition:	Correctly total the shopping bill from the grocers
Division:	Share out the biscuits using the simple technique provided.
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Tables:	Make a start or improve on those important times tables.

Sum Takeaway (Maths Level 2) Age 6-7 yrs.

Nineteen flexible excercise programs of games for up to four children are contained on twin cassettes or disk programmed for your home computer.

Each child's name is entered at the start and a complete record of results kept. All games can be set at two ability levels with with up to 100 games for each exercise.

Right answers bring a Cheshire Cat grinning from the screen, a correct tick and a happy tune. Wrong answer and the program gives the unsuccessful child extra help.

Cheshire Cat Sum-Takeaway includes:

Addition:	Full hello to sums.
Subtraction:	Starts with differences and introduces Take Away.
Charts:	Ways of recording information. A vital concept in the child's future.
Tens & Units:	Delightful visual hello to numbers over nine.
Multiply:	First step in those times tables and the 'X' sign.

Sum Measure Age 9-13 yrs.

Six programs with a choice of 6, 10 or 20 questions are contained on twin cassette or disk programmed for your home computer.

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Cheshire Cat **SUM MEASURE** includes:-

Length:	Work out the length of a line in centimetres or millimetres.
Area:	Find the area of a rectangle using cm^2.
Volume:	Give the volume of a cuboid in cm^3.
Temperature:	Work out the temperature shown on the thermometer.
Mass:	Read the correct balance scale
Capacity:	Measure the amount of liquid in the cylinder

Sum Times (Maths Level 4) Age 8-9 yrs.

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Right answers bring a Cheshire Cat grinning from the screen, a correct tick and a happy tune. Wrong answer and the program gives the unsuccessful child extra help.

Cheshire Cat Sum Times includes:

Tally & Bar Charts:	An easy introduction to graphs.
Time:	A moving clock for digital time.
Tens & Units:	Addition & Subtraction of numbers over nine
Symmetry:	Lines of symmetry.
Co-ordinates:	Important for reading maps and graphs.
Square Units:	Invaluable for calculating areas etc.

and much, much more . . .

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(Including a unique opportunity)

This is your opportunity to see not only a professional boxing match, but one in which Barry McGuigan will be challenging for the World Super Featherweight Title.

The fight will take place in early February at the London Arena – newly built as part of the London Docklands complex – and this will be the first contest to be held there, creating worldwide interest and comment. Love it or hate it boxing is an ancient sport and Barry McGuigan is one of its most respected exponents. Definitely a fight not to be missed.

1st PRIZE

Two tickets for you and a friend to see this world class bout

PLUS A signed copy of By Fair Means of Foul

PLUS Any other two Superior Software games.

2nd PRIZE

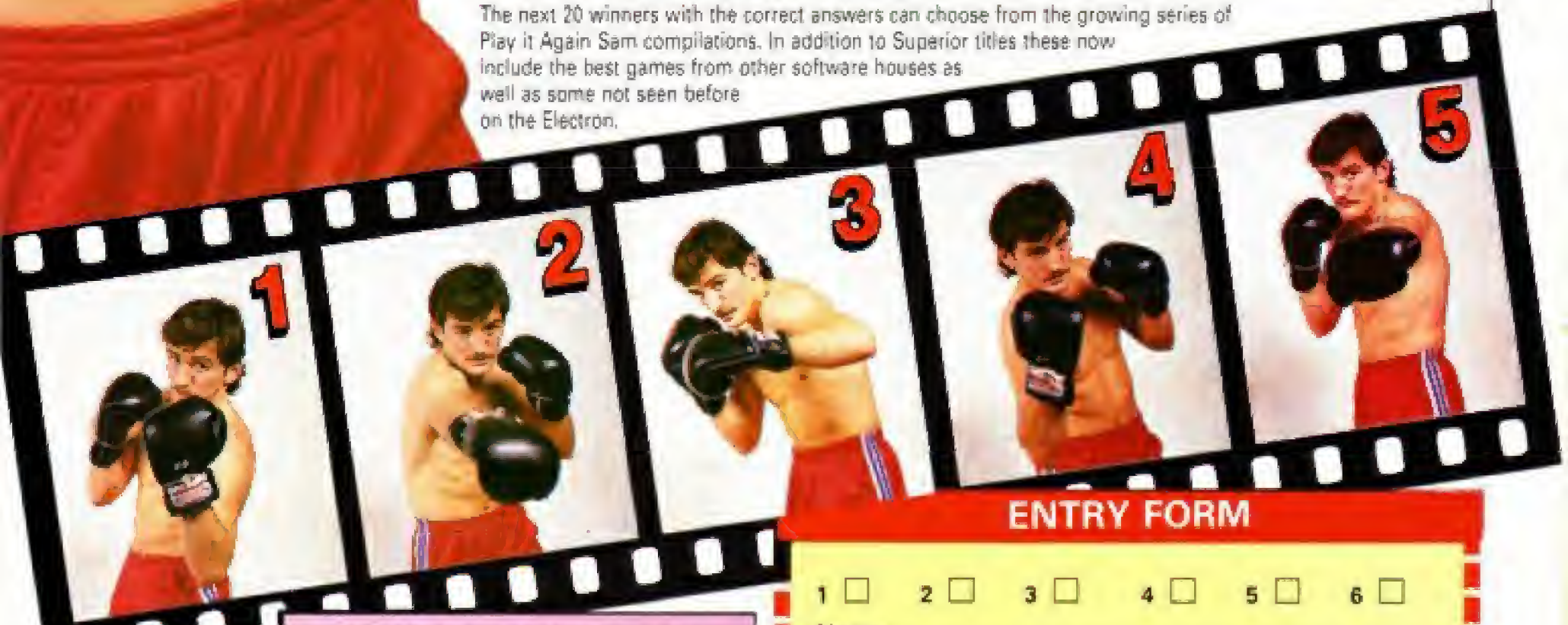
The next four correct entries to be pulled from the sack will each receive a signed copy of this excellent boxing game – which allows you to cheat as long as the referee doesn't catch you!

PLUS

You can also choose one more title from the superb array of games now available from Superior Software.

RUNNERS UP PRIZES

The next 20 winners with the correct answers can choose from the growing series of Play it Again Sam compilations. In addition to Superior titles these now include the best games from other software houses as well as some not seen before on the Electron.



THE ANSWERS

A. Right Punch
B. Left Punch
C. Right Hook
D. Left Hook
E. Left Uppercut
F. Right Uppercut

WHAT YOU HAVE TO DO

Above are five poses of classic boxing moves. All you have to do is match these with their correct terms. The first entries with the right answers will be the winners.

If you think that picture A is a Right Punch then mark an A in the first box in the entry coupon. When you have completed all the boxes add your name, age, address and send it to us to arrive no later than January 20 1989.

ENTRY FORM

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐

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Address: .....

.....

..... Postcode: .....

Tel: ..... Age: .....

Now send to Fair Competition, Electron User, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.

Driving hardware

Roland Waddilove puts a new disc interface through its paces

THE Pegasus 400, from that well known supplier of quality add-ons Slogger, is a new disc interface for the Electron. During the past three years well over half a dozen disc filing systems in various interfaces have appeared – and some have now disappeared too. So what has Pegasus to offer that hasn't been seen before?

The strongly constructed Acorn cream interface is in the form of a large cartridge that plugs into the Plus 1 or Rombox Plus. To make use of it you'll also need to buy either a 5.25in or 3.5in disc drive with a built in power supply.

The interface contains an E00 1770 DFS, which means that it is compatible with the BBC Micro's disc filing system. So you can pop a BBC Micro disc in and read it without any problems (though actually running BBC Micro programs is an entirely different kettle of fish).

Also PAGE is kept firmly at &E00, so you don't lose any of your valuable ram when you upgrade to discs. Compare this to the Plus 3's ADFS which rather greedily demands 3.5k of workspace for its own exclusive use. The upshot is that you won't experience any difficulty running long tape-based programs that you have transferred to disc.

Functions and utilities

Present are all the standard DFS functions and utilities for formatting discs, renaming, locking, wiping, destroying and deleting files, selecting the drive, directory and library, and copying files or discs. The figure below shows the full command list.

An unusual addition is TYPEAHEAD, a command unique to Pegasus. Normally when the Electron accesses the disc drive it switches off all interrupts, so anything typed at the keyboard is ignored, which can at times be a frustrating waste of time. However, this command enables interrupts providing you have fitted a Slogger Turbo Driver or Master Ram Board and you can type away while the disc is being accessed.

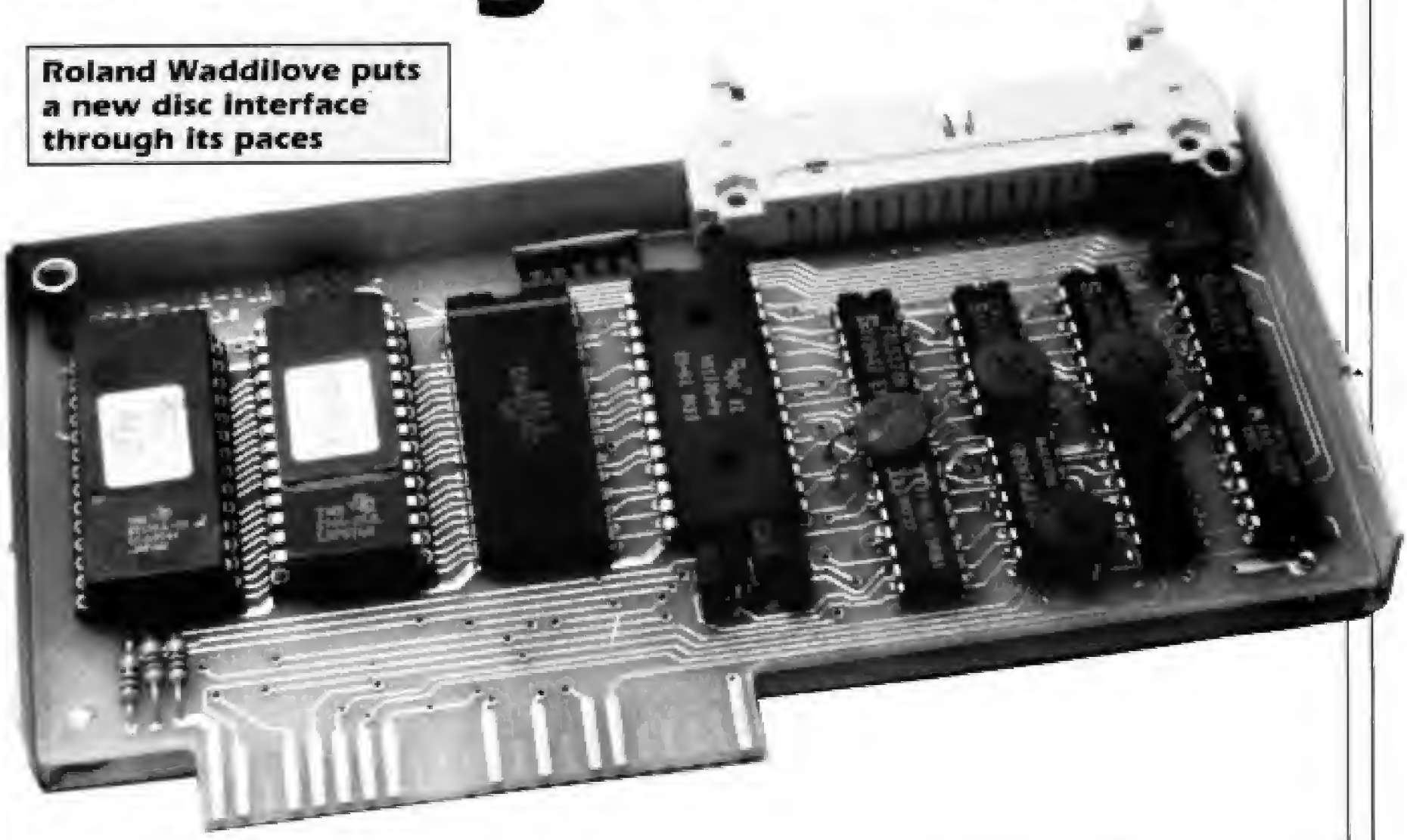
Another nice addition to the range of commands is MCOPY, which is like the normal COPY

Turn to Page 26 ▶

```
Slogger PEGASUS 400 1.01
  ACCESS     <afsp> (L)
  BACKUP     <src drv> <dest drv>
  COMPACT    (<drv>)
  COPY       <src drv> <dest drv> <afsp>
  DELETE     <fsp>
  DESTROY    <afsp>
  DIR        (<dir>)
  DRIVE      (<drv>)
  ENABLE
  INFO       <afsp>
  LIB        (<dir>)
  MAP        (<drv>)
  MCOPY      <src drv> <dest drv>
  RENAME     <old fsp> <new fsp>
  RUNPROT    <fsp>
  STAT       (<drv>)
  TITLE      <title>
  TYPEAHEAD <argument>
  WIPE       <afsp>

OS 1.00
```

The Pegasus DFS command list



◀ From Page 25

command except that it copies as many files as it can fit in memory, rather than one file at a time. This is most useful for single drive owners, as it cuts down disc swaps to a bare minimum.

RUNPROT is used in conjunction with T2PEG4 – the tape to disc transfer utility. It runs a transferred program straight from disc with the advantage of not requiring any ram for its workspace (T2PEG4 needs 256 bytes).

STAT is another name for the more familiar FREE which tells you how much of the disc has been used and how much space is left.

The usual DFS tools are all present and correct – BUILD, DISC, FORMAT, LIST, TYPE and VERIFY. An addition to this list is FDCSTAT, which returns the error of the last disc operation if somethig went wrong.

The table below shows how the performance of the Pegasus 400 compares to its rivals the AP4 and AP3/Plus 3. The bench tests reveal that there's little difference between it and the AP4, but both offer significant speed improvements over the AP3/Plus 3.

The reason, of course, lies in the filing systems. The AP3/Plus 3 uses the advanced disc filing system (ADFS) whereas the Pegasus and AP4 are DFS. Where the ADFS scores is in storage space, offering over half as much again per disc.

The Pegasus manual is excellent, being large, well written, full of technical information containing many useful examples and everything is clearly explained. It takes you right from first principles up to the osword &7F calls for directly accessing the disc controller. It is a model for others to emulate.

Conclusion

Slogger's Pegasus 400 is very similar to Pres' AP4 in many ways, and there is little to choose between them. The AP4 is fractionally smaller and £5 cheaper, but the Pegasus has a couple of extra useful, though not essential, commands.

Bench test	Pegasus DFS	AP4 DFS	Plus 3 ADFS
1. SAVE 16k	4.72	3.40	3.41
2. LOAD 16k	3.6	3.52	2.65
3. OPENIN x 1000	7.07	9.51	31.38
4. OPENOUT x 1000	21.93	21.71	6.49
5. PRINT# 1000 numbers	10.28	10.42	15.43
6. PRINT# 100 strings	3.44	3.98	6.28
7. INPUT# 1000 numbers	6.31	9.73	9.43
8. INPUT# 100 strings	2.88	3.51	3.40
9. BPUT# 1000 bytes	4.59	4.51	6.43
10. BGET# 1000 bytes	3.49	3.89	4.26
11. Move PTR# forward x 1000	3.86	3.38	7.55
12. Move PTR# backward x 1000	3.67	3.42	7.64

Disc filing system bench tests

```
Slogger PEGASUS 400 1.01
  BUILD      <fsp>
  DISC
  DUMP       <fsp>
  FORMAT     (<drv>)
  FDCSTAT
  LIST       <fsp>
  TYPE       <fsp>
  VERIFY     (<drv>)

OS 1.00
```

The DFS tools

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The screen pictures show the BBC Micro versions of the games.

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DIY noticeboard

OVER the past few years Teletext televisions have become increasingly popular. These sets have the ability to decode and display the many hundreds of pages of information produced by the Ceefax and Oracle services and transmitted along with the normal TV picture.

The BBC Micro has always had the enviable ability to show these pages using its special Teletext Mode 7 display. The humble Electron can in fact also reproduce these pages, but it requires extra hardware and software which these days can cost more than the micro itself. So, the facility is there if you are willing to pay for it, but is there a cheaper alternative?

Roland Waddilove presents a utility to enable you to create your own electronic information service

ElkView – the utility presented here – provides you with the facility to set up your own rival display system similar to Ceefax and Oracle. Unfortunately, it won't enable you display Teletext pictures, but it will let you create your own. The only restriction is that you must have a disc system.

Using the built in editor you can create and store up to 300 pages of information containing both text and graphics. Then using the display facility you can show them in sequence on a carousel or select and directly go to a particular page of interest. A moment's thought will reveal that there are dozens of uses for ElkView – shop window adverts, a company information service, a school magazine or newsreel, library and museum information services and so on.

Although the chunky graphics are crude by today's computer standards, as you can see from the screen dumps, like Ceefax and Oracle, the pages produced can be quite attractive – it's all down to your own creative and artistic ability. The screen mode used is four-colour Mode 1 and in addition to all the keyboard characters, there are 32 pre-defined graphics characters.

The program is in two parts and you need to enter and run the first before the second can be used. Program I simply defines the 32 graphics characters used so enter and save this to disc with the filename View1. Now enter Program II – the edit and display utility – and save it with the name View2. To run ElkView, chain or load and run Program I. This will define the characters then automatically load and run the main program.

You'll first be asked for the name of an ElkView

Program I

```
  10REM ElkView Characters
  20REM By R.A.Waddilove
  30REM (c) Electron User
  40VDU23,224,240,240,240,240,0,0,0,0
  50VDU23,225,15,15,15,15,0,0,0,0
  60VDU23,226,0,0,0,0,15,15,15,15
  70VDU23,227,0,0,0,0,240,240,240,240
  80VDU23,228,240,240,240,240,15,15,1
5,15
  90VDU23,229,255,255,255,255,0,0,0,0
 100VDU23,230,15,15,15,15,15,15,15,15
 110VDU23,231,255,127,63,31,15,7,3,1
 120VDU23,232,1,3,7,15,31,63,127,255
 130VDU23,233,0,0,0,0,0,0,255,255
 140VDU23,234,255,255,0,0,0,0,0,0
 150VDU23,235,192,192,192,192,192,192
,192,192
 160VDU23,236,3,3,3,3,3,3,3,3
 170VDU23,237,204,204,51,51,204,204,5
1,51
 180VDU23,238,204,204,51,51,0,0,0,0
 190VDU23,239,0,0,0,0,204,204,51,51
 200VDU23,240,170,85,170,85,170,85,17
0,85
 210VDU23,241,170,85,170,85,0,0,0,0
 220VDU23,242,0,0,0,0,170,85,170,85
 230VDU23,243,0,1,2,5,10,21,42,85
 240VDU23,244,170,84,168,80,160,64,12
8,0
 250VDU23,245,128,64,160,80,168,84,17
0,85
 260VDU23,246,170,85,42,21,10,5,2,1
 270VDU23,247,0,0,0,255,255,0,0,0
 280VDU23,248,0,0,0,31,31,24,24,24
 290VDU23,249,0,0,0,248,248,24,24,24
 300VDU23,250,24,24,24,248,248,0,0,0
 310VDU23,251,24,24,24,31,31,0,0,0
 320VDU23,252,24,24,24,24,24,24,24,24
 330VDU23,253,1,3,6,12,24,48,96,192
 340VDU23,254,128,192,96,48,24,12,6,3
 350VDU23,255,8,4,6,255,255,6,4,8
 360CHAIN "View2"
```

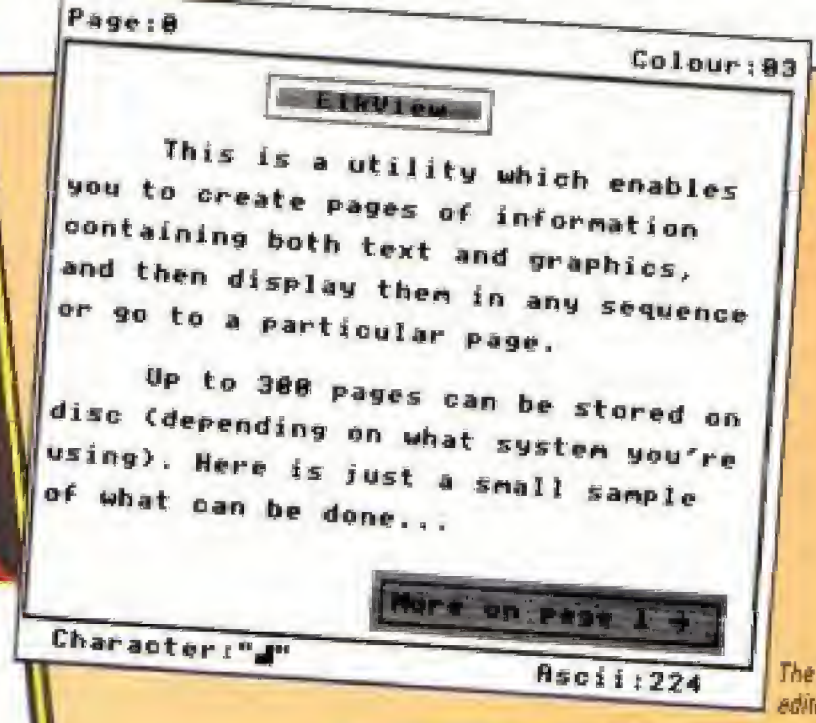
PROCEDURES

edit	Enter the page editor	**write**	Print the current graphic character
save	Save the current page	**initialise**	Define the variables and arrays
load	Load a new page	**char**	Increment the graphic character

Program II

```
  10REM ElkView
  20REM By R.A.Waddilove
  30REM (c) Electron User
  40ON ERROR CLOSE#0:OSCLI"FX4":MODE6
:REPORT:PRINT" at line ";ERL:END
  50MODE6:PROCinitialise:MODE1:*FX16
  60PRINT ' "Edit or Display (E/D)?";
  70IF GET$="D" PROCview
  80PROCedit
  90END
 100
 110DEF PROCview
 120INPUT ' ' "First page to display"
;first
 130INPUT ' "Last page to display";la
st
 140page=first
 150REPEAT
 160PROCload(page):VDU23,1,0;0;0;0;
 170page=page+1
 180k$=INKEY$2000
 190IF k$>="0" AND k$<="9" REPEAT:PRI
NT TAB(0,1)"Page to go to?"k$;:k$=k$+G
ET$:UNTIL RIGHT$(k$,1)=CHR$13:page=VAL
 k$
 200IF page>last page=first
 210UNTIL 0
```

A finished page of text and graphics



The ElkView editor

file. Enter a filename and if the file already exists on the disc it will be opened for editing or displaying, otherwise a new file with blank pages will be created and opened. The first time you run the program you'll have to create a new file in which to store your pages of information.

After entering the filename you'll be asked if you want to edit or display the pages. Press E to select the editor and the first page (zero) will be loaded ready for editing. The controls are quite simple: Press C to change the pen and paper colour, I to input text, S to save the page and L to load another. Use the cursor keys to move the flashing cursor around the screen.

To input text tap I (Caps Lock must be on) and enter your text. Press Return to exit this mode. Note that you can only enter one line of text at a time. The colour – selected by pressing C – is shown in the top right hand corner of the screen. The first digit is the pen colour and the second is the paper.

The currently selected graphics character is shown at the bottom left hand corner of the screen, and its Ascii code is shown to the right. To flick through the graphic character set press the spacebar, and to copy the character to the current cursor position press Copy.

You can't use Delete to erase text or graphics. To do this either set the pen and paper to zero and press Copy, or press I and input a blank space. To copy one page to another press S and save the page with a different page number. When you have created and saved all the pages for your ElkView file press Escape to close the file and exit the program.

Run ElkView again, and this time when you are asked if you want to edit or display the file press D to display it. At the appropriate prompts enter the number of the first page to display followed by the last. The pages will be loaded and displayed in sequence with a delay of about 20 seconds in between each one.

You can enter a page number to go to if you don't want to see them in order – just tap in the number and you'll jump straight to that page. You can also move on quickly to the next by pressing the spacebar.

The program is currently set for a maximum of 25 pages, but you can alter this by changing the variable *last* in line 690 to the number you want. Each page requires just over 2k of disc space, so how many you can fit on your disc depends on your system. Forty track DFS discs can store around 45, and double sided 80 track ADFS discs can handle around 300.

VARIABLES

first	First page to display
last	Last page to display
char%	The current graphic character
page	The current page number
X%,Y%	Cursor coordinates
S%	Copy of the screen characters
C%	Copy of the screen colours

EDITOR CONTROLS

L	Load a new page
S	Save the current page
I	Input text (until Return is pressed)
C	Choose the pen and paper colour
Space	Select graphic character
Copy	Copy graphic character to cursor position
Cursor keys	Move the cursor
Escape	Quit and close file

```
  220ENDPROC
  230DEF PROCedit
  240X%=0:Y%=0:char%=224:col%=3
  250PROCload(0):PROCchar(0)
  260REPEAT:*FX202,32
  270PRINT TAB(X%,Y%+2);
  280K%=GET
  290IF K%=ASC"I" REPEAT:K%=GET:PROCwr
ite(K%):UNTIL K%=13
  300IF K%=135 PROCwrite(char%)
  310IF K%=ASC"C" col%=(col%+1)MOD16:P
ROCchar(0)
  320IF K%=32 PROCchar(1)
  330IF K%=ASC"L" PROCload(FNinput("lo
ad")):PROCchar(0)
  340IF K%=ASC"S" PROCsave(FNinput("sa
ve")):PROCchar(0)
  350X%=X%+(K%=136ANDX%>0)-(K%=137ANDX
%<39)
  360Y%=Y%+(K%=139ANDY%>0)-(K%=138ANDY
%<28)
  370UNTIL FALSE
  380ENDPROC
  390DEF PROCwrite(N%)
  400IF N%>31 AND N%<>127 ?(C%+X%+Y%+4
0)=N%:?(C%+X%+Y%+40)=col%:COLOURcol%DI
V4:COLOUR128+col%MOD4:VDU N%;X%=X%-(X%
<39)
  410ENDPROC
  420DEF FNinput(a$)
  430COLOUR128:COLOUR3:PRINT TAB(0,1)S
PC(20)TAB(0,1)a$;
  440INPUT N%:=N%
  450DEF PROCchar(N%)
  460REPEAT
  470char%=char%+N%
  480IF char%=256 char%=224
  490COLOUR col%DIV4:COLOUR 128+col%MO
D4:VDU 31,13,31,char%
  500COLOUR3:COLOUR128
  510PRINT TAB(2,31)"Character:";CHR$3
4;CHR$9;CHR$34;TAB(28,31)"Ascii:";char
%" ";TAB(31,1)"Colour:";col%DIV4;col%M
OD4
  520UNTIL INKEY$0=""
  530ENDPROC
  540DEF PROCsave(N%)
  550IF N%>last N%=last
  560PTR#F%=40*29*N%*2
  570FOR I%=0 TO 40*29-1:BPUT#F%,C%?I%
:BPUT#F%,S%?I%:NEXT
  580PRINT TAB(0,1)SPC(20)TAB(0,1)"Pag
e:";N%
  590ENDPROC
  600DEF PROCload(N%)
  610VDU22,6:PRINT " "Page:";N%
  620IF N%>last N%=last
  630PTR#F%=40*29*N%*2
  640FOR I%=0 TO 40*29-1:C%?I%=BGET#F%
:S%?I%=BGET#F%:NEXT
  650VDU22,1:PRINT TAB(0,1)"Page:";N%
  660FOR I%=0 TO 40*29-1:COLOUR C%?I%D
IV4:COLOUR 128+C%?I%MOD4:VDU S%?I%:NEX
T
  670ENDPROC
  680DEF PROCinitialise
  690last=25:*FX4,1
  700PRINT TAB(0,2)"ElkView"
  710PRINT "--------"
  720DIM S% 40*29,C% 40*29
  730INPUT " "File to create/edit/disp
lay";file$
  740F%=OPENUP file$:IF F% ENDPROC
  750F%=OPENOUT file$
  760FOR I%=1 TO 40*29*(last+1)
  770BPUT#F%,0:BPUT#F%,32
  780NEXT
  790CLOSE#0
  800F%=OPENUP file$
  810ENDPROC
```

If you want to start doing more with your micro than just playing games, this package is your ideal introduction to the four most popular applications for professional computers. All the programs have been designed for simplicity, so even a child can use them. Yet they include advanced features not yet available on programs costing many times as much!

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All is revealed

John Geraghty presents SpeciaList, a handy little utility to improve your program readability

IT can be quite difficult and time-consuming hunting through program listings trying to find a particular command, function or procedure. Now such toils are a thing of the past, thanks to SpeciaList, which is designed to greatly improve readability of both on-screen and printed listings.

When the routine is enabled all Basic keywords are printed in bold, line numbers are italicised and assembler labels are underlined.

This also all applies to printouts, making listings much clearer and easier to read than before. Using SpeciaList is a piece of cake: Enter and run the listing to create, save and enable the short machine code utility. It's also a good idea to save the Basic listing. Once this is done it can be called into action with commands like:

```
LIST:ON
```

to list the whole program on screen, and:

```
LIST 100,200:ON
```

to list just part of a program – lines 100 to 200 in this case. You aren't restricted to listing just the program currently in memory, as you can type NEW and enter another, or load one from disc or tape. To obtain a printed output simply press Control+B before entering the LIST:ON command and press Control+C afterwards.

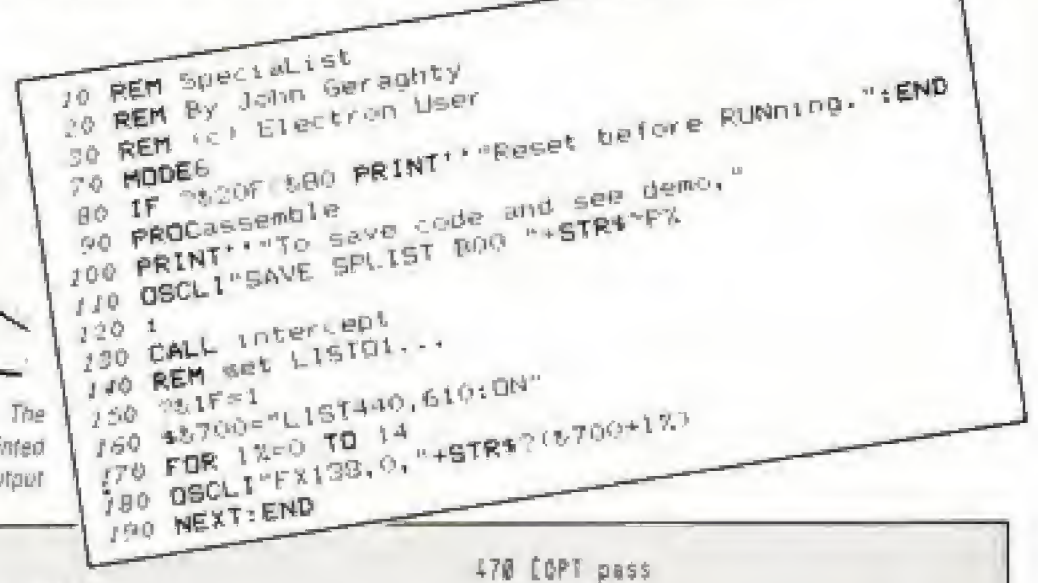
If you want to disable the utility enter:

```
LIST:OFF
```

The machine code routine that performs SpeciaList's functions is automatically saved when the program is run. It can be reloaded and enabled with:

```
*LOAD $PLIST
CALL &B00
```

To quote an old cliché: "You'll wonder how you ever managed without it".



```
10 REM SpeciaList
20 REM By John Geraghty
30 REM (c) Electron User
70 MODE6
80 IF ?&20F<&80 PRINT''"Reset before RUNning.":END
90 PROCassemble
100 PRINT''"To save code and see demo,"
110 OSCLI"SAVE SPLIST B00 "+STR$~P%
120 :
130 CALL intercept
140 REM set LISTOI...
150 ?&1F=1
160 $&700="LIST440,610:ON"
170 FOR I%=0 TO 14
180 OSCLI"FX138,0,"+STR$?(&700+I%)
190 NEXT:END
```

The printed output

```
10 REM SpeciaList
20 REM By John Geraghty
30 REM (c) Electron User
70 MODE6
80 IF ?&20F<&80 PRINT''"Reset before RUNning.":END
90 PROCassemble
100 PRINT''"To save code and see demo,"
110 OSCLI"SAVE SPLIST B00 "+STR$~P%
120 :
130 CALL intercept
140 REM set LISTOI...
150 ?&1F=1
160 $&700="LIST440,610:ON"
170 FOR I%=0 TO 14
180 OSCLI"FX138,0,"+STR$?(&700+I%)
190 NEXT:END
200 :
210 DEF PROCassemble
220 REM &37 contains the byte of Basic program being Listed...
230 char=&37
240 REM block for Osword &04...
250 block=&CF7
260 space=&20
270 list_tkn=&C9
280 on_tkn=&EE
290 off_tkn=&87
300 osword=&FFF1
310 osbyte=&FFF4
320 wrchv=&20E
330 mode=&355
340 style=&70
350 label=&72
360 bracket=&73
370 print_flg=&74
380 :
390 REM escape sequence for Epson-type printers...
400 bold$=CHR$27+CHR$53+CHR$27+CHR$48+CHR$27+CHR$71
410 ital$=CHR$27+CHR$72+CHR$27+CHR$48+CHR$27+CHR$52
420 unde$=CHR$27+CHR$72+CHR$27+CHR$53+CHR$27+CHR$45+CHR$49
430 norm$=CHR$27+CHR$72+CHR$27+CHR$53+CHR$27+CHR$45+CHR$48
440 :
450 FOR pass=0 TO 2 STEP2
460 P%=&B00
470 [OPT pass
480 .intercept
490 LDA wrchv+1
500 BPL changed
510 SEI
520 STA oswrch+2
530 LDA wrchv
540 STA oswrch+1
550 LDA #main MOD&100
560 STA wrchv
570 LDA #main DIV&100
580 STA wrchv+1
590 CLI
600 .changed
610 RTS
620 :
630 .main
640 STA block
650 LDA mode
660 CMP #7
670 BEQ exit2
680 TXA
690 PHA
700 TYA
```

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◀ From Page 31

```
  710 PHA
  720 \&09;&0C points to &700 when in
command mode, but not when Listing;
  730 LDA &0C
  740 CMP #&07
  750 BNE list_chk
  760 \read if printer enabled;
  770 LDA #&75
  780 JSR osbyte
  790 TXA
  800 AND #1
  810 STA print_flg
  820 BEQ no_print1
  830 LDA #bold DIV&100
  840 STA style+1
  850 .no_print1
  860 LDA #0
  870 STA bracket
  880 BEQ exit
  890 .list_chk
  900 LDX #&FF
  910 JSR spaces
  920 CMP #list_tkn
  930 BNE exit
  940 .chk2
  950 INX
  960 LDA &700,X
  970 CMP #&00
  980 BEQ exit
  990 CMP #ASC":"
 1000 BNE chk2
 1010 JSR spaces
 1020 CMP #on_tkn
 1030 BEQ listing
 1040 CMP #ASC"_"
 1050 BNE off_chk
```

To save code and see demo,
>LIST440,610:ON

```
  440 :
  450 FOR pass=0 TO 2 STEP2
  460 P%=&900
  470 [OPT pass
  480 .intercept
  490 LDA wrchv+1
  500 BPL changed
  510 SEI
  520 STA oswrch+2
  530 LDA wrchv
  540 STA oswrch+1
  550 LDA #main MOD&100
  560 STA wrchv
  570 LDA #main DIV&100
  580 STA wrchv+1
  590 CLI
  600 .changed
  610 RTS
```

>*SAVE SCREEN 5800 8000

```
 1060 LDA #91
 1070 STA bracket
 1080 BNE listing
 1090 .off_chk
 1100 CMP #off_tkn
 1110 BEQ disable
 1120 .exit
 1130 LDA print_flg
 1140 BEQ no_print2
 1150 LDA #normal MOD&100
 1160 JSR printer
 1170 .no_print2
 1180 LDA #0
 1190 STA char
 1200 STA label
 1210 PLA
 1220 TAY
 1230 PLA
 1240 TAX
 1250 .exit2
 1260 LDA block
 1270 JMP oswrch
 1280 :
 1290 .spaces
 1300 INX
 1310 LDA &700,X
 1320 CMP #space
 1330 BEQ spaces
 1340 RTS
 1350 :
 1360 .disable
 1370 SEI
 1380 LDA oswrch+1
 1390 STA wrchv
 1400 LDA oswrch+2
 1410 STA wrchv+1
 1420 CLI
 1430 BRK
 1440 EQUB 100
 1450 EQUS "SPECIALIST disabled"
 1460 BRK
 1470 :
 1480 .listing
 1490 LDA block
 1500 CMP #46
 1510 BCC exit
 1520 CMP #123
 1530 BCS exit
 1540 CMP #ASC":"
 1550 BEQ exit
 1560 CMP #ASC"\"
 1570 BEQ exit
 1580 :
 1590 LDA char
 1600 BMI token
 1610 PLA
 1620 PHA
 1630 BEQ lineno
 1640 :
 1650 LDA block
 1660 \check for square brackets;
 1670 CMP #91
 1680 BNE not_assem_start
 1690 STA bracket
 1700 .not_assem_start
 1710 CMP #93
 1720 BNE not_assem_end
 1730 STA bracket
 1740 .not_assem_end
 1750 LDA bracket
 1760 CMP #91
 1770 BNE exit
 1780 LDA block
 1790 CMP #ASC"."
 1800 BNE not_label_start
 1810 STA label
 1820 .not_label_start
 1830 LDA label
 1840 BNE over
 1850 JMP exit
 1860 .over
 1870 LDA print_flg
 1880 BEQ no_print3
 1890 LDA #underlined MOD&100
 1900 JSR printer
 1910 .no_print3
 1920 JSR getdef
 1930 LDA #170
 1940 ORA block+8
 1950 STA block+8
 1960 BNE new_char
 1970 :
 1980 .token
 1990 LDA print_flg
 2000 BEQ no_print4
 2010 LDA #bold MOD256
 2020 JSR printer
 2030 .no_print4
 2040 JSR getdef
 2050 LDX #1
 2060 .loop1
 2070 LDA block,X
 2080 ASL A
 2090 ORA block,X
 2100 STA block,X
 2110 INX
 2120 CPX #9
 2130 BNE loop1
 2140 BEQ new_char
 2150 :
 2160 .lineno
 2170 LDA print_flg
 2180 BEQ no_print5
 2190 LDA #italics MOD256
 2200 JSR printer
 2210 .no_print5
 2220 JSR getdef
 2230 LSR block+1
 2240 LSR block+2
 2250 ASL block+6
 2260 ASL block+7
 2270 .new_char
 2280 LDA print_flg
 2290 BNE printer_enabled
 2300 LDA #159
 2310 BNE new_char_end
 2320 .printer_enabled
 2330 \normal to printer only, modifie
d to screen only;
 2340 LDA #1
 2350 JSR oswrch
 2360 LDA block
 2370 JSR oswrch
 2380 LDA #3
 2390 JSR oswrch
 2400 LDA #159
 2410 JSR oswrch
 2420 LDA #2
 2430 .new_char_end
 2440 JSR oswrch
 2450 PLA
 2460 TAY
 2470 PLA
 2480 TAX
 2490 RTS
 2500 :
 2510 .oswrch
 2520 JMP &FFFF \dummy address
 2530 :
 2540 .getdef
 2550 LDA #&0A
 2560 LDX #block MOD256
 2570 LDY #block DIV256
 2580 JMP osword
 2590 :
 2600 .printer
 2610 CMP style
 2620 BEQ printend
 2630 STA style
 2640 LDY #0
 2650 .printloop
 2660 LDA #1
 2670 JSR oswrch
 2680 LDA (style),Y
 2690 JSR oswrch
 2700 INY
 2710 CPY #7
 2720 BNE printloop
 2730 .printend
 2740 RTS
 2750
 2760 .bold EQUS bold$
 2780 .italics EQUS ital$
 2800 .underlined EQUS unde$
 2820 .normal EQUS norm$
 2840 ]:NEXT:ENDPROC
```

PRES

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FAX: 0276 51427

Now available through PRES **Advanced Computer Products** range of software products

ADVANCED CONTROL PANEL

(20) /M/B/E/C **£30 ex VAT £34.50 inc VAT**

ACP is a front end control panel language providing a sophisticated yet friendly interface between user and computer for access to Languages, MOS functions and the users own file utility etc. Main features include pull down windows, simple to change MOS configure, floating point calculator, file manager, SW ROM's facilities

(16K EPROM & FULL MANUAL)

"It's very easy to create an entire customised front end for your own use." – *Acorn User, August 1987.*

"ACP is much better than any of the other front end systems I've seen." – *Acorn User, August 1987*

"I can recommend it to anyone who wants easy access to the Electron's functions." – *Electron User, August 1987.*

ACPs main features are:-

* Pull down windows operate throughout
* Users can create their own windows
* Simple to change MOS-s configure options
* Easy entry to other languages
* Floating point calculator
* File manager
* Floating point calculator

ADVANCED DISC TOOLKIT

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Any Acorn user including Master, BBC B+, Electron, DFS, 1770 DFS, ADFS, 2nd & co-processors A.C.P.'s BEST SELLING product containing over 30 commands inc.: - powerful memory & disc editor, search memory/disc/basic, catalogue/unplug ROMS, load/run programs below page, automatic menu, file transfer (inc. locked cassette files), ADFS utils etc, etc ("it's superb",. . . Database Pubs. - "A top-class toolkit - I have no hesitation in recommending it. . . Acorn User Nov. 86)

(16K EPROM & FULL MANUAL)

ADVANCED ELECTRON DFS Eøø

(14) /E+ASR/ **£17.38 ex VAT £19.99 inc VAT**

An alternative to the DFS on rom for Plus 3 and ABR users. This optional alternative DFS is designed for use in Sideways RAM (ABR) and allows the user to operate a disc filing system &Eøø when using the Plus 3 (in ADFS page would normally be &1Døø). The DFS is simply loaded using the software supplied with the ABR from disc. (3.5" ADFS disc + manual)

ADVANCED ELECTRON DFS

(05) /E/ **£21.00 ex VAT £24.15 inc VAT**

Electron & Plus 3 users. . . gain BBC compatibility by adding the Advanced Electron DFS (1770 DFS) this is the same disc filing system supplied with the BBC B+. Now you can produce and access (compatible) BBC disc based software. We can also supply 5.25" disc drives to add to your Plus 3 (inc. 2nd. drive adapter). "ACP has produced another superb ROM for the Electron". . . Electron User Feb '86

(supplied on 16K EPROM + DFS MANUAL)

ADVANCED DISC INVESTIGATOR

(06) /M/B/E/C **£25 ex VAT £28.75 inc VAT**

A very powerful Disc utility for standard & non-standard discs. Backup most protected discs, edit any type of non-standard disc, check & repair faulty tracks, create new disc formats, copy 40 track discs to 80 track discs, verify two non-standard discs.

("ADI features an extremely comprehensive sector editor, and one of the finest I've seen". . . Tubelink on Prestel) (supplied on 16K EPROM + manual)

ADVANCED 1770 DFS

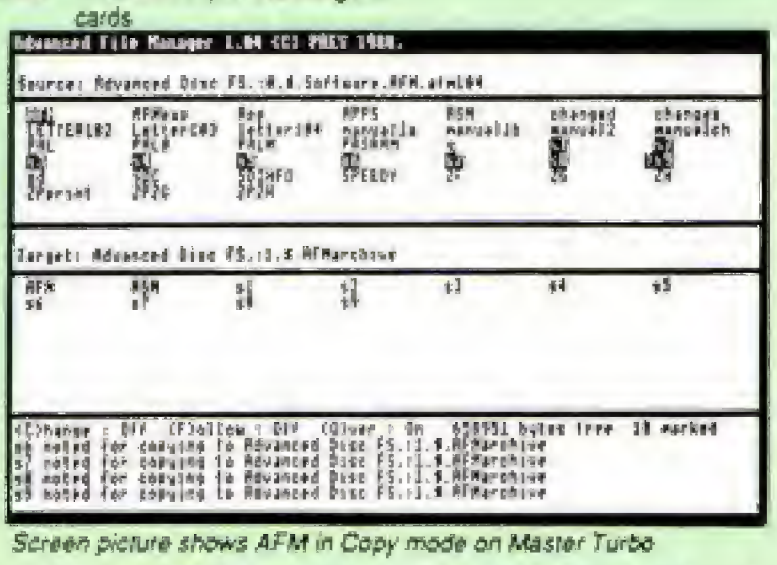
3 versions ADM/C(11) – ADB(12) ADE (13) **£30.00 ex VAT £34.50 inc VAT**

ACP have totally re-written the Acorn 1770 DFS, enhancing existing features & adding new ones. The result is a very fast and powerful disc filing system with the ability to operate in double density occupying both sides of a disc (640K). Automatic file relocation, improved file handling, 62 file catalogue and Sways RAM can be used as a fast RAM DISC. (16K EPROM + comprehensive manual)

PRES – ADVANCED FILE MANAGER

The ultimate 'front-end' for ADFS and DFS includes:

Menu – infinitely expandable
Delete – deletes any number of files
Rename – rename multiple files using wild-cards
Copy – extremely comprehensive file copier



Screen picture shows AFM in Copy mode on Master Turbo

AFM follows the PRES 'Master Plan' of upwards compatibility – it runs on Electron, BBC B, B+, B+128, Master 128 and Compact, with Second/Co-processors and Acorn-compatible versions of DFS & ADFS.

£25 ex VAT · £28.75 inc VAT

AFM has four distinct modes:

MENU – allows browsing through the files and directories on a disc. Files are started from a menu of up to 7 options chosen for a selected ROM. Loaders are provided for Basic, The Basic Editor, View, ViewSheet, ViewStore, ViewSpell, Edit, Wordwise (+) and InterWord. This list can be expanded infinitely using an Acorn-approved OSWORD call. . . full details and example in the manual..

DELETE – allows files to be marked and then deleted with one keystroke.

RENAME – allows one or more files to be marked and then renamed using a wildcarded name, ie one which varies with each file renamed. Thus you could rename s1, s2 and s3 to be s1_old, s2_old, and s3_old in one operation. . . and that's only the beginning! As well as using the whole of the original name you can also pick out individual characters to form part of the new name.

COPY – the strongest feature of AFM. It is a two stage copy routine. With both source and target directories shown on screen the files to be copied are marked. Once all the files have been marked copying is started and the computer can be left to get on with it!

Large files can be split across several disks, and recombined.

As much as possible of the computer's memory is used for copying files, including unused parts of shadow screen memory, sideways ram banks (inc. AP7), ram cartridges (inc. ABR (32K) and AQR (256K)), tube memory (up to 61K), B+ paged ram (12K) and unused parts of the Slogger Master Ramboard (Electron).

Comprehensive error trapping and recovery is provided, so a copying run will rarely have to be aborted unfinished! And there's much, much more.

DATABASE PUBLICATIONS: Electron software now available exclusively through PRES on 3.5" disc

Electron User 1988 Monthy Disc	£4.75
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*Arcade Game Creator	£5.95
Nursery Rhymes	£6.95
10 of the Best Vol 1	£6.95
10 of the Best Vol 2	£6.95
10 of the Best Vol 3	£6.95
10 of the Best Vol 4	£6.95
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5.25" disc versions available only

*Arcade Game Creator	£5.95
Knitwear Designer	£9.95

**Back issues of Electron User required, see Database Publications own advertisement*

PRES

THE ADVANCED PLUS 3

Now you can turn your Electron & +1 into a full disc system – no more waiting for tape loading or 'bad block'/'data?' messages. A.P.3. gives you . . .

UNBEATABLE PRICES

OUR TOP SELLING PRODUCT

1. A fully Acorn compatible 1770 interface
2. 80 track 3.5" disc drive, as used by Acorn (320k capacity)
3. Separate PSU
4. Acorn ADFS
5. Welcome disc
6. Utilities
7. Full documentation
8. All the advantages of the original Plus 3 PLUS extra ROM socket.

All this without dramatically increasing the required desk space!
Now well into the SECOND THOUSAND production.
Remember – 2nd drives (3.5 or 5.25) can be added and the AP3 drive can be used on a BBC or Master computer! Also most Electron disc-based software is supplied on 3.5" ADFS discs.
The only fully compatible disc upgrade running Acorn's own preferred filing system (supplied on: Plus 3, Master 128, Master Compact and now the Archimedes)
EXTRA BONUS
3 games on disc – SNAPPER – DRAUGHTS – REVERSI

COMPLETE PACKAGE ONLY
£99.00 excl VAT; £113.85 Inc VAT

ADVANCED PLUS 5

A unique interface for those wanting the maximum expansion from just one slot in the PLUS 1. AP5 contains:- a User port for connecting peripherals such as a mouse, 1 MHz bus allowing Music 5000(E), prommers and various control devices to be added, Tube interface for connecting an Acorn 2nd. processor or even a Master Turbo board (through a 'Co-Pro Adaptor') – & TWO spare ROM sockets (1 high priority). All hardware connections are Acorn compatible thereby allowing many BBC products to be added (remember that some software modification may be necessary for the Electron). So although some expansion options may appear expensive on an Electron you do have upward compatibility.
£58.00 Ex VAT; £68.24 Inc VAT

ADVANCED PLUS 1 . . . The plus 1 is the main expansion for the Electron. It provides the Centronics parallel printer, port, joystick interface and 2 cartridge slots into which go ROM cartridges including View, Viewsheet, Pascal, Logo and our own popular range of disc upgrades.
£43.43 excl VAT; £49.95 Inc VAT

ADVANCED PLUS 6 . . . a fully buffered 6 ROM expansion module for the Electron user. AP6 is fitted inside the advanced Plus 1 or a modified Acorn Plus 1 (when used with the Acorn Plus 3, 5 ROM sockets are available). All sockets are designed to accept either ROM/EPROMS or RAM chips. A further feature is the optional AP7 upgrade.
"A marvellous piece of design . . . don't hesitate, buy it!"–*EU, May '88*
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UPGRADE SERVICE for the original Acorn Plus 1 to Advanced Plus 1 and AP6. This will provide all the benefits of AP6 and also includes the printer circuit modification for some modern printers. (AP6 can be fitted to original Plus 1 by users with soldering experience) for upgrade service add £7.00 + VAT to AP6 price ie
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ADVANCED ROM ADAPTER 2
An Acorn approved cartridge containing a card with special 'zero' profile sockets that allow you to fit compatible 8k or 16k EPROMS/ROMS. The cartridge is fully enclosed providing complete protection for your ROMS. Simple to use – No switching – complies fully to the Acorn (sideways) Rom filing system.
"The best ROM cartridge is by far the AP4 2...*A&B Dec 86*
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ADVANCED BATTERY-BACKED RAM
A standard Acorn approved cartridge but containing 32k (2 x 16k) of sideways RAM. The added bonus is the battery-backed feature that holds the RAM contents when the power is switched off! Different ROM images can be loaded into either bank from ROM images previously saved. The banks can also be locked to imitate ROM use. Now it is possible to have View & ViewSheet in one cartridge every time you switch on. Other uses include &E00 ADFS, printer buffer, ROM software development. The use of ABR is simplified by the newly written PRES software utilities which include:- SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put your own software from disc or tape into ABR & use the ROM filing system. All software is supplied in ABR with a simple menu to transfer the utilities to your own media. No hardware switching – totally software controlled. Instructions for using supplied software and necessary information for users developing their own applications.
"It's a superb add-on and a must for all serious Electron users". . . *Electron User*
£34.77 excl VAT; £39.95 Incl VAT

DISC INTERFACES (Plus One required)

AP3 INTERFACE: As supplied with AP3 package. A fully Acorn compatible disc interface that will accept any standard 5.25" or 3.5" 80T drive with PSU. It runs Acorn's ADFS (as supplied on Acorn Plus Three, Master 128, Master Compact and now the Archimedes) supplied with A.D.F.S. manual and welcome disc + Utilities and 3 bonus games (please specify 3.5" or 5.25" 80T format). Also provides a spare 16K rom socket.
Price £52.00 ex VAT £59.80 Inc VAT

AP4 INTERFACE: A fully Acorn compatible disc interface that will accept any standard 5.25" or 3.5" drive with PSU. It runs the 1770 DFS (as fitted in the BBC 'B' and Master) keeps pace at &E00 – has utilities in rom and provides a spare 16K rom socket (DFS manual included.
Price £60.83 ex VAT £69.95 Inc VAT

AP34 INTERFACE: Get the best of both filing systems. Now available from PRES the ultimate interface. Fitted with both Acorn approved filing systems. . . Acorn's current standard ADFS and Acorn 1770 DFS (which can be run at &E00) ADFS and DFS manuals supplied + ADFS welcome disc with utilities.
Price £69.55 ex VAT £79.98 Inc VAT
Please state 5.25" or 3.5"

ADVANCED PLUS 2 ROM

We feel this is one of the best, low cost, additions we have produced for the Electron & +1 user, especially for Plus 3, AP3 & ABR users.
Now with this easy to fit upgrade you can add:

1. Fix for Tape filing system in Hi-res screen modes.
2. *ROMS – to display all ROMs/ROM images present on the system.
3. *UNPLUG – disable ROM/RAM image.
4. *INSERT – enables or inserts a previously unplugged ROM.
5. *KILL – to totally disable the Plus 1.
6. *LOCK – to lock a sideways RAM bank in ABR, AQR, AP7.
7. *LROMS – to lock all sideways RAM banks found.
8. *UNLOCK – to unlock a sideways RAM bank in ABR, AQR, AP7.
9. *UROMS – to unlock all sideways RAM banks found.
10. *SAVEROM – saves a copy of a ROM image to the current filing system.
11. *LOADRUN – loads a ROM image from the current FS into a RAM bank.
12. *FORMAT – will format an ADFS disc for Plus 3 or AP3.
13. *VERIFY – reads and tests every sector on an ADFS disc.
14. *VFORM – formats and verifies an ADFS disc in one command.
15. *BUILD – creates a text file that can be used by *EXEC (ie !BOOT).
16. *LIST – displays a numbered listing of a text file.
17. *TYPE – displays a file on screen with no line numbers.
18. *DUMP – to view a file's contents on screen.
19. *LANG – selects a default language to be booted on <CTRL-BREAK>.
20. *HELP – provides a full 'help' list on all the ROM's commands

"STOP PRESS"

21. *AQRPAGE– selects the specified page in any AQR present.

Now there is no need to search for your utilities disc every time you want to Format/Verify a disc, Build a !Boot file or Lock/unlock/Load a ROM image into ABR PLUS much more . . . the ideal companion from the company that produces the Acorn Plus 1.
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PRES ABR SOFTWARE
The new PRES ABR software now available separately containing SaveROM, LoadROM, Lock, Unlock, Printer Buffer, Zero and MakeROM a new utility to put our own software from disc or tape into ABR & use the ROM filing system. Supplied on 3.5" ADFS or 5.25" DFS disc.
3.5"£9.99 ex VAT; £11.49 Inc VAT
5.25"£8.99 ex VAT; £10.34 Inc VAT

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An internal battery-backed RAM upgrade for the Advanced Plus 6. TWO 16K pages of Sideways RAM, battery-backed and featuring full write protect facility. Just like ABR but fitted internally & vacating a cartridge slot. This product is compatible with all Acorn BBC/Master & Electron computers. **£39.00 ex VAT; £44.85 Inc VAT**

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£19.99 ex VAT; £22.95 Inc VAT

DUE TO INCREASED COSTS SOME PRICES WILL ALTER IN THE NEW YEAR – SO ORDER NOW

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Suitable for existing Plus 3 or A.P.4 users. This new version has the software fixes for Zysyshelp, write protect disable & compaction. Also Winchester code has been replaced with the necessary driving software to handle ACR as a 256k RAM DISC. Please note – ADFS is Acorns adopted standard filing system supplied on the Plus 3, Master 128, Master Compact & now the Archimedes. Supplied on 16k ROM with Welcome disc & utilities. Please state 3.5"/5.25" welcome disk.
£14.95 ex VAT; £17.19 inc VAT
(ADFS manual supplied separately)

ADFS E00
For ELectron users with either Plus 3 or A.P.4 and 32k of S/W RAM i.e. ABR. All the benefits of ADFS but without all the loss of RAM! Includes all the software 'fixes' as in version 1.1 as well as the ACR/RAM DISC code and an 'FX' call for managing the new & original ADFS. One of the most frequent questions we are asked: "How do I get back the memory lost on my Plus 3 system?" Answer: PRES ADFS &E00 regains 3.75k leaving page @ &E00 the same as Tape!
ADFS E00 supplied; 3.5" ADFS (manual available separately)
£14.95 ex VAT; £17.19 inc VAT
5.25" ADFS (manual avail. sep.) **£14.00 ex VAT; £16..10 inc VAT**
5.25" DFS (2 discs+ADFS manual) **£19.00 ex VAT; £21.85 inc VAT**
(See Special Package Prices)

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(Adventure Language Programming System)
Well received on the BBC now available for Electron users on a 16K Rom and utilises disc either, 3.5" ADFS or 5.25" DFS
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PRES special 3.5" sing/sided 80 track, inc. psu.	*ONLY* £59.00	£67.85

DISCS
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VIEW & VIEWSHEET . . . both products as above *special price*. £22.00

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ABR + 5.25" ADFS E00	£43.33 ex VAT	£49.95 inc VAT
ABR + 5.25" DFS (ADFS E00)	£47.78 ex VAT	£54.95 inc VAT
AP5 + Music 5000	£152.17 ex VAT	£175.00 inc VAT
AP7 + 3.5" ADFS E00	£49.52 ex VAT	£56.95 inc VAT
AP7 + 5.25" ADFS E00	£48.65 ex VAT	£55.95 inc VAT
AP7 + 5.25" DFS (ADFS E00)	£52.13 ex VAT	£59.95 inc VAT
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AP1 + AP4 + CS400	£182.60 ex VAT	£209.99 inc VAT

ACCESSORIES

ELECTRON POWER SWITCH
For those who are fed up with removing the power connector every time when resetting the computer or for those whose jack-plug connector has become unreliable by removing the power at random! This useful accessory provides a double-pole in-line switch with a new power jack-plug already attached: just connect to the existing lead, having removed the old jack-plug. **£3.96 ex VAT; £4.55 inc VAT**

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Replaces existing drive cable with one containing an extra connector for adding a second drive configured as Drive 1.
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Converts the fitting at the back of the original Acorn Plus 3, to take a standard disc drive connector when adding a second drive which has been configured to Drive 1.
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Panasonic KX-P1081 Printer Ribbon
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A.D.F.S Guide Manual **£5.00**

ELECTRON ADVANCED USER GUIDE . . . further reading and information for the Electron user. £3.95

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5 adventures available on disc for Electron users. Each game is sold separately on disc: Ultimate Prize, Dreamtime, Pirates Peril, Taroda Scheme and Stranded.
3.25" ADFS £6.95 ex VAT per Disc; £7.99 inc VAT per Disc

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Printer ideal for Electron Plus 1, Panasonic KX-P1081 Graphic Epson Compatible NLQ ready to connect including cable, delivery and VAT
£155.65 ex VAT £179.00 inc VAT

COMING SOON
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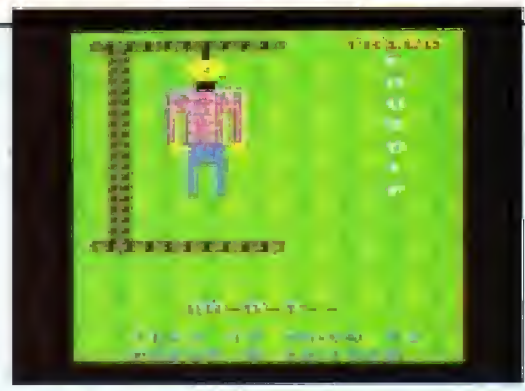

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electron user ARCADE CORNER

Compiled by MARTIN REED

THE Slogger Turbo Driver has turned a number of BBC Micro games that were once unplayably slow on the Electron into great games in their own right. Software Invasion's Attack on Alpha Centauri is an example.

It has to be admitted that the speed of our beloved Electron – at least in its basic form – does not quite match that of its big brother. Programmers have used a number of techniques to get round this. One is to make the graphics slightly smaller and to use Mode 4 or 5 – if there's less to move, it can be moved faster.

However, some native Electron games, such as Bonecruncher, feature graphics identical to those of the BBC Micro version, with a corresponding decrease in speed. The Turbo Driver now comes into its own, restoring the game to full speed, with a keyboard response to match. Arcade Corner accordingly recommends the Turbo Driver to all keen Electron arcade enthusiasts.

This month's goodies come from Christopher Seatory from Washington, Tyne & Wear, Alix Jones from Bellingdon, Bucks and Pam Milne from Warrington, Cheshire.

An easy life

Life of Repton
Superior Software

TO follow on from the August 1988 column in which we revealed the passwords and edit codes for Around the World in Forty Screens, here are the equivalent details for Life of Repton:

Baby		School		Teens		Work		OAP	
A	BABY 15890	SCHOOL	36216	TEENS	61268	WORK	21812	OAP	28910
B	KEYHOLE 44287	ADVANCE	14562	TURBINE	32854	INCLINE	7814	UNAWARE	18768
C	FAILURE 58847	BAPTISE	49514	WEAKEN	51857	HOSTAGE	60159	SOAKING	57820
D	GADGETS 24882	LESSONS	39008	CHEAPLY	53452	TWISTED	9677	EVOLVES	21489
E	REACTOR 61197	ZIPPERS	21622	OVERLAP	22868	TAXABLE	14439	QUIBBLE	52892
F	REUNION 19047	BLEAKLY	27442	PADLOCK	43672	WARTIME	21383	NATIVES	30995
G	OBSERVE 5867	CORPSES	4831	DIALLED	13517	ALGEBRA	57802	JUMPING	21764
H	DIVERGE 36440	ZYGOTES	21882	CIRCLES	4485	BETTING	996	SHALLOW	35864

Passing the word

Bonecruncher
Superior Software

HERE are the passwords for the 24 levels of Superior's Bonecruncher:

1 No password	
2 BEGINNER	14 DRAGON
3 ATOMIC	15 CHAMBER
4 COMPLEX	16 DUNGEON
5 ANIMAL	17 TORTURE
6 NOMINAL	18 SLIMEY
7 SCORPION	19 ULTIMATE
8 TOLERANCE	20 SLIPPERY
9 SCAREY	21 COUNTDOWN
10 CRAZY CAVE	22 FATIGUE
11 LEPPARD	23 DANGEROUS
12 SNAKE	24 DARKNESS
13 PEWTER	25 EXCALIBUR

Dodgy poke

Blagger
Alligata

SINCE I published in the November 1987 column an infinite lives poke for Alligata's Blagger, it has been brought to my attention that the poke may not work on later versions of the game – notably the one on Beau Jolly's 10 Computer Hits Volume 4.

To make amends for owners of that version, I have devised the following. Put the fully rewound tape into the recorder and type:

```
*LOAD EBLAG1
?&382A=&60:CALL &3000
```

Wait until all the files have loaded, then enter any of the following pokes:

```
!&2913=&0D0D01A9 : REM infinite lives
?&28EF=4 : REM number of lives 1-255
!&28F4=&0668DEAEA : REM start screen
```

and finally CALL &2872 to start the game.

Achieving the impossible

Impossible Mission
US Gold

The following extremely useful routine gives infinite lives and snoozers on Impossible Mission – a game so good I once considered buying a Commodore 64 just to play it. Luckily the game came out on the Electron just in time!

Enter Program I and save it on a blank tape as IMC. Then press Break and type in and run Program II. Put the Impossible Mission tape in the recorder fully rewound and press Play. Wait until the IM1 file has loaded, then save the modified version of this file on your own tape after IMC.

Press Break then chain IMC. When the message *Searching* appears after the IMCheat file has loaded, replace your tape with the original Impossible Mission tape and press Play. The GAME?? and GAME2?? files load as usual, but you now have infinite lives and snoozers.

```
10 REM Impossible Mission Cheat
20 REM by Chris Seatory
30 REM (C) Electron User
40 REM
50 C%=0:FOR A%=&100 TO &134 STEP 4
60 READ A$:!A%=EVAL("&"+A$):C%=C%+
!A%
70 NEXT:IF C%<>&8AEF6C66 VDU 7:PRI
NT"Data incorrect" ELSE *RUN IMCheat
80 DATA 01A02AA2,78FFF720,04801649
90 DATA 8D01A902,4C580205,A9430E00
100 DATA 09BB8D30,8D09BD80,04A909BE
110 DATA 4C685785,2E4CD947,454D4147
120 DATA 207F8232,00303034
```

Program I

```
10 REM Impossible Mission Converter
20 REM by Chris Seatory
30 REM (C) Electron User
40 REM
50 !&100=&2903CAAD:!&104=&3CA8DFE:?
&108=96
60 ?&220=0:?&221=1:*FX14,4
70 *LOAD IM1
80 !&1676=&3EDD2B:*FX13,4
90 *SAVE IMCheat 1400+301 400 400
```

Program II

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Thrust	Quest	Living Daylights	Despatch Rider
Plan B	Thunderstruck 2	Deathstar	Phantom

Volume 2

Repton 3	Combat Lynx	Palace of Magic	Ransack
Around the World	Paperboy	Icarus	Imogen
Life of Repton	Saigon	Impact	Uridium
Plan B2	Spycat	Magic Mushrooms	Karate Combat
Codename: Droid	Spellbinder	Planetoid	Repton 3 passwords

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MICRO MESSAGES

Advanced machine code technique

THIS may seem a slightly dated question as it concerns your first series on writing arcade games which started in July 1985, but as I have only just got around to learning machine code I have only recently been able to read and understand them. I must first say I've found them a great help and I've learnt quite a bit, although on reading the article in the November 1985 issue, I came across something I did not quite understand. On looking over the listing, I found these two lines which caused some difficulty:

```
  480 .olddata LDA &3000:EOR (old),Y:
STA (old),Y
  490 INC olddata+1:BNE p%:INC olddat
a+2
```

I can't work out why line 480 contains LDA &3000 and not LDA &C00, which is where the character data is stored. You said in the program discription that olddata actually points to the first byte of the LDA opcode, so one is added to get the olddata low byte and two to get the high byte.

My query is: What has the address &3000 got to do with the location of the data, and what does INC olddata+1 and INC olddata+2, actually increase? I know these questions probably seem daft to you, but when it comes to machine code I always seem to run into problems or forget about most of the stuff I've read about, and have to go over it again. – **Colin Harris, London.**

● This is quite an advanced technique, but one well worth getting to grips with. The assembler will assemble the code to produce something like this:

```
900             .olddata
900 AD 00 30    LDA &3000
903 51 70       EOR (old),Y
905 EE 01 09    INC olddata+1
908 D0 03       BNE p%
908 EE 02 09    INC olddata+2
```

The label *olddata* is set to &900, and the opcode for LDA – &AD – is stored at &900. The low byte of the address &3000 is stored at &901 and the high byte is at &902. Before the print routine is called the address of the sprite data is stored at *olddata*+1 – &901 – overwriting the &3000. The increment commands increment *olddata*+1 and *olddata*+2 – &901 and &902 – the sprite data address. The &3000 is a dummy address and isn't used.

Summer smash hit

TYNESOFT has done it again! Summer Olympiad's fantastic graphics, animation, sound, music, title screens and gameplay makes it even better than Winter Olympiad 88, and my personal all-time favourite game. Particularly good features of the game are the lighting of the Olympic flame in the opening ceremony and the replay option after each event.

The game requires a lot of skill and strategy. After much practising I have won gold medals in fencing (9.0), triple jump (17.53m.) and skeet shooting (64.02), but a 110m hurdles or a diving medal still eludes me.

I am now eagerly awaiting the future release of Superman, and Circus Games (which includes lion taming). Finally, congratulations are in order for making Electron User, *especially the software reviews, even better. Well done!* – **Paul Sanderson, Chesterfield, Derbyshire.**

Colourful characters

HOW do you produce multi-coloured user defined characters? I am writing a Hangman program and need this technique for graphics. I am not quite sure if I have seen this before in Electron User, *but if it has been published previously, could you please tell me in which issue? And if not, how can this be achieved?* – **Carl Hetherington (Aged 10), Ashby-de-la-Zouch, Leicestershire.**

● To print multi-coloured characters you need to print at the graphics cursor by using VDU5. Here is a short program to demonstrate this technique:

```
  10 REM Multi-Coloured
  20 REM Characters
  30 MODE 2
  40 VDU 5
  50 MOVE 640,512
  60 GCOL 0,1
  70 PRINT "/"
  80 MOVE 640,512
  90 GCOL 0,2
 100 PRINT "\"
 110 MOVE 640,512
 120 GCOL 0,3
 130 PRINT "_"
 140 VDU 4
```

For a three-colour character you need to print three characters in three colours one on top of the other.

You normally need to define a separate graphics character for each colour, but the program here displays an underlined X using the built-in character set.

First enable printing at the graphics cursor using VDU 5, then MOVE to the position you want the character to be printed. Select the colour of the first character with GCOL and print it. MOVE back to the same position, set the next colour and print the next character. Repeat the process for the third colour.

Apply some Turbo pressure

I HAVE just bought a Slogger Master Ram Board for my Electron and when flicking through some back issues of Electron User *I noticed an advertisement for it. It says you can run Acornsoft's Aviator Flight Simulator when in Turbo mode. Is this true, and if so, is it worth getting?*

Now on to 64k games. Come on Electron User *readers, if you have a Master Ram Board please start pressurising Superior Software to release 64k games using both this and the Turbo Driver as well. It could put them on the B side of the normal Electron games – more likely to if everyone writes in.*

Also the new look of the magazine is great, but I would like to see more reviews for games. – **Christopher Illidge, Holmes Chapel, Cheshire.**

● Aviator does run in Turbo mode, but whether it is worth getting is a matter of personal opinion. Although quite old now, when it was released it was rated as one on the best flight simulators around.

Moving the screen down

I WOULD like to thank Keith Watts of Watford (Micro Messages, November 1988) for his cure for lock-ups. I recently bought a second hand 32k Electron, and when I plugged it in it did just the same thing Keith's did. The following day one of my friends brought a copy of Electron User, *and as I was reading the mail section I saw Keith's letter and followed his example. It did the job! Thanks Keith.*

*Is there any way to move the screen down a line? On the BBC Micro either *FX144,255 or *TV255 will accomplish this, but neither seem to work on the Electron. Finally, does anyone know*

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◀ From Page 39

where I could get a copy of the Forth language on cassette? Keep up the good work! – **R. Webb, Thurcroft, Rotherham, S. Yorks.**

● The Electron hasn't got a software command to move the screen down a line like a BBC Micro can. However, a TV engineer can easily adjust the screen height for you.

Acornsoft used to produce an excellent Forth package on tape, but we can't find anyone currently supplying it. Can any readers help?

Disc upgrade no problem

I AM an English boy living in Holland, and I own an Electron, Plus 1 and Cub colour monitor. I'm thinking of upgrading my Electron with a disc system. I can get a Cumana disc drive from my uncle's work place, because he uses BBC Micros. Can I still get the Cumana disc interface – and where from, or will the disc drive work with the AP4 or AP3 interface?

I would also like to ask if there is an Electron User *club? Your magazine is great, keep up the good work.* **R. S. Warren, Lelustad, Holland.**

● A BBC Micro disc drive with its own power supply will work perfectly well with an Electron. You'll need a disc interface such as the AP3, AP4, Cumana or Pegasus. The AP4 and Pegasus use BBC Micro compatible discs so in your case, these are probably better than the AP3 or Cumana. There isn't an official User Club.

The way to high speed

PLEASE don't succumb to the people who want more software reviews and cheats. The magazine stalls are full of magazines which have nothing but this in them. I think the layout of Electron User *is fine as it is.*

Enough of that. I am writing to ask which microprocessors would be compatible with the Electron instead of the 6502. I am looking to speed up my machine and do not want the expense of a Master Ram Board or Turbo Driver. There was a letter in the November 1988 issue of Electron User *concerning the computer locking-up. I had an identical problem with my machine, and following what your reader did I have now cured the fault. Thank you Keith Watts.*

Please could you stop quoting old back issues in reply to queries, as far as I'm concerned, they're unobtainable.

Which do you think would be the best disc interface to get – Pegasus from Slogger, or Plus 3, Plus 4 or Plus 3A all from Pres? – **Gareth Boden, Southport, Lancashire.**

● Unfortunately you can't gain speed by replacing the 6502 with another chip, as there isn't another one suitable for the Electron. A Turbo is the only solution.

All our early issues have sold out and are no longer available, but many readers do have back issues, so find the references very useful.

All Electron disc systems are excellent, and there's little to choose between them. The AP3A enables you to access both ADFS and DFS discs and is the most flexible system.

Driver for Star printer

IN reply to S.E. Stevenson's letter published in the October 1988 issue of Electron User *regarding the use of the Star LC-10 with the Electron: Yes, the printer driver from the August 1987 issue does work with the LC-10.*

The codes needed are in appendix B of the printer manual. The table below shows some examples:

Print style	On	Off
Italic	27,52	27,53
Emphasised	27,69	27,70
Double-strike	27,71	27,72
Underlining	27,451	27,45,0
Superscript	27,83,0	27,84
Subscript	27,83,1	27,84
Double-height	27,119,1	27,119,0

Star LC-10 print codes

I don't bother with NLQ highlights, as it is easier to set them from the control panel – which is one of the best things about the LC-10. Another tip regarding the printer driver that may interest readers is that it is possible to get 32 different print, pitch, and character set effects using the driver by ignoring the off codes and using the off to switch something else on. Obviously this is fairly impractical and hard to keep a track of, but I did find it useful when I had to do a bibliograph that contained many different European characters. I was able to switch between all the character sets and still use various print enhancements all in one driver. So thank you very much Electron User *and Julie Boswell for a very useful utility.*

Also a thank you to Ian Booth for his label printer for View published in the October 1987 Electron User.

However, I would like to know if it is possible to print out all the addresses in a file at once, rather than one at a time? I feel this would greatly increase the usefulness of this utility.

If it is possible to publish an upgrade I would be very grateful.

One more thing about the label printing: I noticed that in Mini Office II there is a label printing program. I have Mini Office I on cassette, so is it possible to exchange this plus cash for Mini Office II on disc or is this just for the BBC Micro? I have a Pegasus 400 system (5.25in disc).

If Mini Office II is not available on 5.25in disc for the Electron and it is not possible to upgrade your October 1987 label printer, do you, or your readers know of a good database label printer for the Electron either on disc or rom? – **Richard Douglas, Leicester.**

● We'll look into the possibility of upgrading the View label printer. Unfortunately, Mini Office II is not available for the Electron, and the BBC Micro version will not work. Can any readers suggest a good database and label printer?

Picture is worth 1,000 words

NEARLY two years ago I received my Electron as a Christmas gift and have happily played on it, but recently I have decided to branch out. At first I decided to get a printer, but soon realised it wasn't as easy as it sounded. So I began to read the various advertisements in Electron User.

All seem to say something about the Plus 1 – please not more mathematics – but really I was confused. I didn't have the slightest clue as to what it was used for, so I thought that was the end of that.

But when I opened my September 1988 issue of Electron User, *I was greeted by a simple diagram provided by Pres, and several questions which I now know the answer to. I would like to thank the Pres team for this simple guide. I have now decided to get the AP1 (yes I do know what it's used for) and the AP3 for the special package price of £149.99. But I still have a couple of queries about it.*

Once I have received my AP1 and AP3 can I use it straight away or do I need special leads not included in the package? Finally, how easy is it to convert some of my own programs and some that are published in Electron User *so they can be used on disc?* – **Kelvin Bierton, Hemel Hempstead, Herts.**

● Unless stated otherwise, it can be assumed

Word processing on an Electron

I OWN an Electron and cassette recorder. I would like to upgrade it as follows: I want to use a disc drive and printer, and also use it as a word processor.

Could you please tell me what I need to buy in order to do this, and the cost. Would it be possible for me to fit the additional pieces myself, or do I have to take it to a special centre? – **Neil Hennessy, Blyth, Worksop, Notts.**

● There is quite a choice of disc systems for the Electron – Pres AP3, AP4 and AP3A, and Slogger Pegasus 400. All are excellent products, but the most flexible is probably an AP3A with one 80 track 3.5in drive and one 80 track 5.25in drive. This will enable you to use BBC format DFS and Plus 3 format ADFS discs. The cheapest system is the Pres AP3 at £113.85

To use a printer you'll need a Slogger Rombox Plus at £54.95 or Pres AP1 at £49.95. View (£14.95 from Pres) or Starword (£19.95 from Slogger) are two excellent word processors. Use Starword with the Rombox Plus, and View with either the AP1 or Rombox.

You can fit all of these yourself as they are straightforward plug-in units requiring no specialist fitting knowledge, and you won't need to open your micro.

that all *Electron User* listings work just as well, if not better, on disc. In fact, some utilities are specifically for discs. No leads are necessary as they both plugs into the back of the Electron.

Down in the dumps

IN ANSWER to John Young's letter in the September 1988 issue of Electron User, *here is a procedure for graphics on a TRS–80:*

```
1000 DEFPROCskdump
1010 REM CALL printer
1020 REM Switch to graphics mode
1030 VDU 29,0;0;
1040 VDU 2
1045 VDU 1,10
1050 VDU 1,10
1060 FOR Y%=1023 TO 0 STEP-28
1070 FOR X%=0 TO 1279 STEP 4
1080 byte=&1
1090 FOR y%=27 TO 0 STEP-4
1100 byte=byte*2
1110 IF POINT(X%,Y%-y%)>&1 byte=byte+1
1120 NEXT
1130 byte=byte+128
1135 VDU 1,byte
1140 NEXT
1150 VDU 1,10
1160 NEXT
1170 VDU 1,30
1180 VDU 3
1190 ENDPROC
```

This does take a long time to print a picture, but if the result is colour it's well worth waiting for. If any reader can speed it up, both Mr. Young and myself would very probably sit up and take notice.

The procedure does work, as I have a Radio Shack TRS–80 DMP100 (Radio Shack Jack for short) and it prints a black and white picture of any colour/black and white picture on the screen.

I have also discovered a fault in the Mini Office word processor. The time clock skips numbers. For example, the clock will go 0.00, 0.01, 0.02, 0.04, 0.05, 0.07, 0.08, 0.09, 0.011. This doesn't cause other faults, but for people who use the clock and trust it, this fault really does bungle the program up. – **Mathew Charman, Horndean, Hants.**

● Thanks for the screen dumps, it is sure to be appreciated by all TRS-80 owners. We don't think the Mini Office clock is wrong, it simply isn't updated frequently enough to display every second. Occasionally two seconds may have passed by the time it is printed, so the time appears to skip a second.

Upgrade dilemma

FULL marks for your new magazine design. It is definitely more colourful, and is clearer to read. But what I am writing about is that I don't know whether to buy an Archimedes or add-ons for my Electron. I don't know which is the better disc size 3.5in or 5.25in – and who makes the best drives? Also, can you tell me if all the BBC Micro games will work on the Electron with the Master Ram Board fitted?

Could everyone please get in touch with US Gold and ask them if they can convert Out Run for the Electron, BBC Micro and Archimedes. – **John Tweedie, Castlemilk, Glasgow.**

● It is always very difficult to advise which upgrade path to take. An Archimedes will cost you at least £800, but a disc system and Master Ram Board for your Electron will only come to around £200. If you are basically quite satisfied with your Electron then a few inexpensive add-ons like a disc system and Master Ram Board will probably be sufficient for your needs for quite some time to come.

The best disc size is probably 3.5in. There is no difference between different makes of drive.

Mystery error message

I HAVE had my Electron for nearly four years now, and have been very pleased with it. Recently I typed in the following short program:

```
10 *KEY10 *FX229,1|MOLD|MRUN|M
20 *FX229,1
30 CLS
40 PRINT
50 PRINT"Acorn Electron"  "BASIC"
60 INPUT">"X$:GOTO 60
```

I ran the program, and as soon as the > sign came up I pressed Break. I got the error message Key In use at line 10. *I looked through appendix B in the user guide, but could not find this error message. Can you tell me what it means?* – **Barry Young, Holywell Bay, Nr. Newquay, Cornwall.**

● This is a very unusual error message, and one that should not occur in this program. The only time it arises is when you try to define a function key within a function key like:

```
*KEY1 *KEY1 PRINT|MPRINT|M
```

Elite cheat

I RECENTLY read in your excellent magazine a plea for anyone having hints or tips for Elite. A couple of years ago I remember that published in The Micro User *was a listing called Elite Cheat. This enabled you to program your own commander.*

The program was written for a BBC Micro with a disc system, but it works 99 per cent perfect on the Electron, the other 1 per cent accounts for the double height text. – **M. Trowsdale, Marden–Ash, Ongar, Essex.**

● You'll find a full Electron version of this program in the November 1988 issue of *Electron User.*

Cost-effective memory

HAVING recently obtained the excellent AP3 disc system, I am now interested in adding usable memory to my Electron. Can you suggest the most cost-effective way of achieving this? In which issue did you review the Advanced Battery Backed Ram? – **L.G. Wilson, Farnborough, Hants.**

● The only way of adding ram to the Electron is with a Slogger Master Ram Board costing £59.95. The Battery Backed Ram cartridge was reviewed in June 1987.

Satisfied customer

PLEASE pass on my thanks to Keith Watts of Watford for his letter in the November 1988 issue of Electron User *concerning a sick machine and the ULA chip. I recognised the symptoms as those of my first Electron, which had been relegated to the loft in disgust after £20 had been spent with an Acorn dealer trying to find the fault – he couldn't discover anything wrong.*

As nothing ventured ... I decided to have a go. I had not opened up the machine before, but soon found the carrier and slid the chip backwards and forwards as Mr Watts directed. The result is that I now have a games machine for the children which has had two days of pounding without going wrong. Previously it went between 20 minutes and an hour before freezing up. Thank you Micro Messages! – **Brian L. Giggins, Towcester, Northants.**

All programs printed in this issue are exact reproductions of listings taken from running programs which have been thoroughly tested.

However on the very rare occasions that mistakes may occur corrections will be published as a matter of urgency. Should you encounter error messages when you type in a program they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the mail pages.

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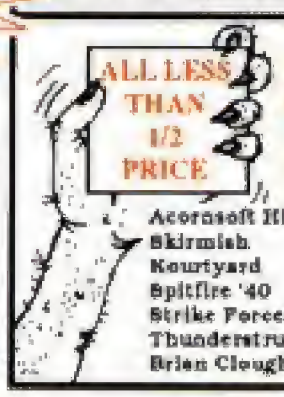

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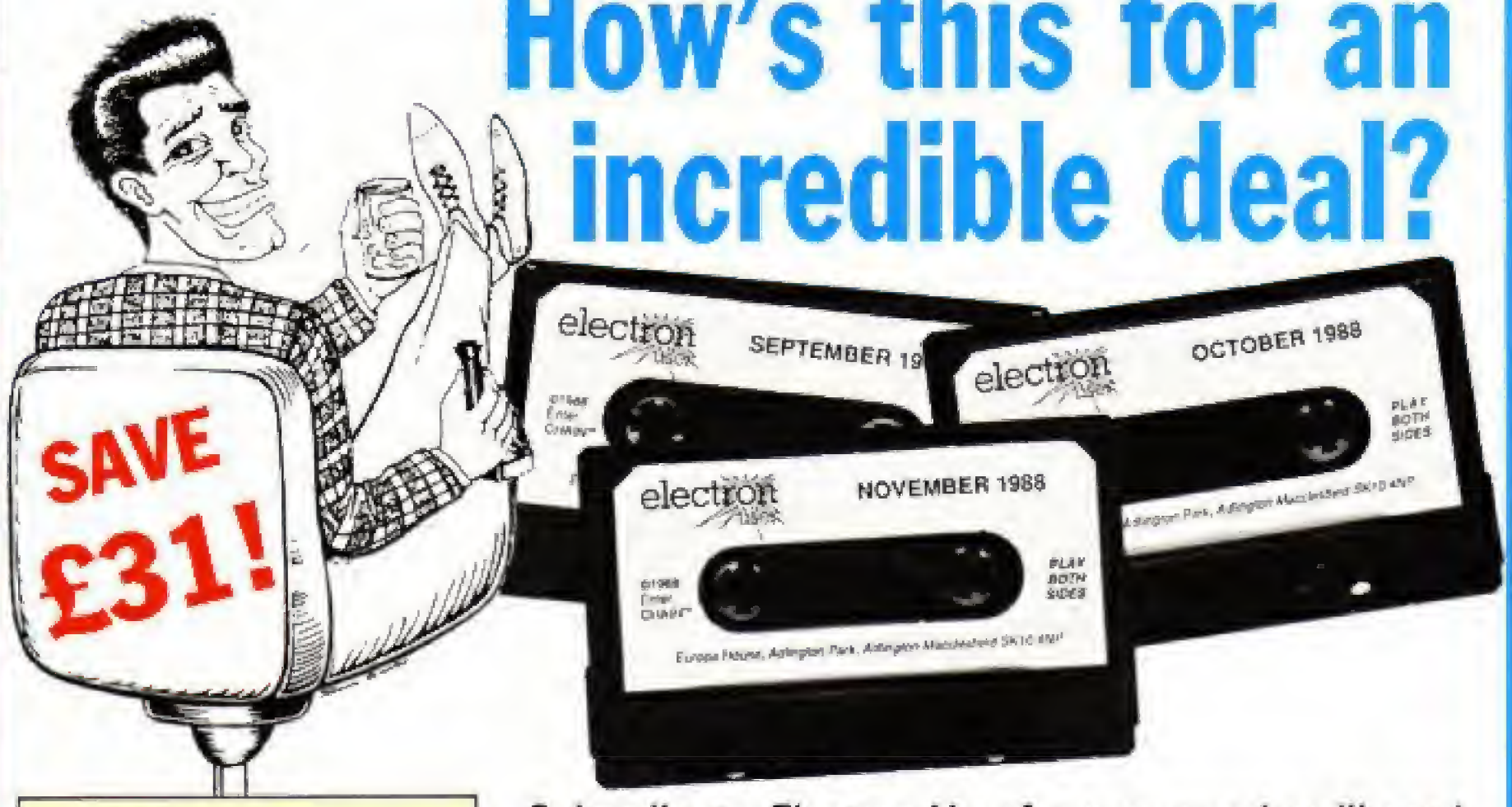

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Scroller

Scrolling the screen is easy with the aid of Paul A. Clarke's interesting utility

Messages that creep up on you

THIS short program demonstrates how to scroll a message across the screen. Regular *Electron User* readers will observe: "But that's been done umpteen times before!". And so it has, but never this smoothly.

What the program does is to scroll a line of text on the Mode 4 screen one pixel at a time. Previous scrolling message utilities could only jerkily move whole characters. The routine also includes wraparound so that pixels disappearing off the left-hand edge of the line reappear at the right.

Program I is a Basic implementation of the scroll routine, and this was used to check that the algorithm developed was correct. Having verified this, it was converted to the machine code shown in Program II.

The technique is to shift eight memory locations left one bit by multiplying each byte by two, the carry bits being temporarily stored.

Then blocks of eight bytes are shifted to the left by multiplying by two and their carry bits are added to the previous block of eight bytes at bit zero. This continues until the end of the line, where the stored bits are added to the final block of eight bytes at bit zero.

The Basic scroller isn't a great deal of use because of its lack of speed, but it does give a sort of slow motion action replay of the super-smooth machine code version.

Program I

```
  10 REM Basic scroller
  20 REM By Paul A. Clarke
  30 REM (c) Electron User
  40 MODE 4
  50 start=&7898
  60 PRINT TAB(4,26)"Written by Paul
A. Clarke"
  70 FOR T%=0 TO 7
  80 N%=?(T%+start)
  90 IF N%>127 THEN T%?&70=1 ELSE T%?
&70=0
 100 ?(T%+start)=N%*2
 110 NEXT
 120 FOR T%=0 TO 255
 130 N%=?(T%+start)
 140 IF N%>127 THEN ?(T%+start-8)=?(T
%+start-8)+1
 150 ?(T%+start)=N%*2
 160 NEXT
 170 FOR X=1 TO 7
 180 IF ?(&70+X)=1 THEN ?(start+248+X
)=?(start+248+X)+1
 190 NEXT
 200 GOTO 70
```

Program II

```
  10 REM Machine code scroller
  20 REM By Paul A.Clarke
  30 REM (c) Electron User
  40 MODE 4
  50 start=&7898
  60 FOR I=0 TO 2 STEP 2
  70 P%=&900
  80 [OPTI
  90 LDX=0
 100 .loop1 LDA start,X
 110 CLC
 120 CMP#128
 130 BCSstore
 140 LDA#0
 150 STA&70,X
 160 .ret1 LDA start,X
 170 ASL A
 180 STA start,X
 190 INX
 200 CPX#8
 210 BNEloop1
 220 .main LDX#8
 230 .loop2 LDA start,X
 240 AND#128
 250 CMP#128
 260 BEQadonext
 270 .ret2 ROL start,X
 280 INX
 290 BNEloop2
 300 LDX#0
 310 .loop3
 320 LDA&70,X
 330 CMP#1
 340 BEQstoreend
 350 .ret3 INX
 360 CPX#8
 370 BNEloop3
 380 RTS
 390 .store LDA#1
 400 STA&70,X
 410 JMPret1
 420 .adonext CLC
 430 LDA start-8,X
 440 ADC#1
 450 STA start-8,X
 460 JMPret2
 470 .storeend CLC
 480 LDA start+248,X
 490 ADC#1
 500 STA start+248,X
 510 JMPret3
 520 ]
 530 NEXT
 540 COLOUR 129:CLS:COLOUR 128
 550 FOR T%=0 TO 255 STEP 4
 560 !(T%+start)=0
 570 NEXT
 580 PRINT TAB(4,26);"Written by Paul
 A.Clarke";
 590 ?&220=0:?&221=9:=FX14,4
 600 VDU 23,128,&F0F0;&F0F0;&F0F0;&F0
F0;
 610 GCOL 0,0
 620 COLOUR 129
 630 COLOUR 0
 640 PRINT TAB(0,0);"Scroller"
 650 VDU5
 660 X=72:Y=700
 670 FOR T=1020 TO 992 STEP -4
 680 FOR M=0 TO 256 STEP 4
 690 X=X+16
 700 IF POINT(M,T)=0 MOVEX,Y:VDU128
 710 NEXT
 720 Y=Y-32:X=72
 730 NEXT
 740 VDU4,23,1;0;0;0;0;
 750 PRINT TAB(0,0);STRING$(8,CHR$32)
 760 REPEAT UNTIL 0
```

Adventures

By Peddragon

Adventurer's Glossary

Queen: Be her champion and do as she commands.
Quicksand: You must cross it, but find a plank first.
Rat: Kill the vermin!
Ravine: Will surely need crossing, so look for a bridge.
Ring: Wear it with care. Remember Gollum!
River: Cross it by bridge or boat.
Robes: Try wearing them, but search the pockets first.
Rocks: Move them or climb them with care.
Rope: For climbing or tying to something.
Rubbish pile: Search it thoroughly, it may contain treasure.
Ruby: A treasure.
Runes: You will need to translate them before you can benefit from their immense knowledge.
Rug: Often a treasure, but may enable you to fly.

Christmas in Camelot

A LOT of the idle chatter among the mead swillers and serious port users at the Christmas festivities in Camelot this year will surely be concerned with the year which has almost passed. The passing moons have seen the Electron consolidate its position as a master among micros.

Nor does its popularity fade, as numerous adventure releases this year have proven. Just consider the goodies which have been released for the Electron during the past 12 months: American Suds, Axe of Kolt, Hex, Blood of the Mutineers, Plane Crash, In Search of Atahaulpa, Annabel Gray, Scoops, The Taroda Scheme, Stranded! to name only a few.

Some cynics may question the Electron's future in an age of megabyte beasts, but they must consider the fact that thousands of Electron users have now upgraded their original machine with many powerful add-ons.

In the world of adventures the full range of BBC Micro Level 9 and Acornsoft games now unfold on Electrons fitted with either Slogger's Master Ram board or Jaffa's Mode 7 adapter. With adventure software houses such as Robico, Riverdale and Heyley continuing their support, the future has hardly ever been brighter.

In confirmation of the above, my mailbag has rarely been quite as bulging. Answering your letters is always a joy, but if you require a per-

Problems

This month's section has a distinctive flavour of readers scratching each others backs. Mrs A. Hawkins of Hinkley has kindly presented me with a complete solution to Riverdale's ***Suds*** *which has enabled me to help David Noble who is experiencing problems in this game.*

You will need to worm your way inside the chewing gum factory, David. That in turn should help you solve your other problem. The reservation number you require in the Crosseyes motel section can be discovered if you examine the scarecrow.

In return for her help, Mrs Hawkins asks for assistance with sticking points in ***American Suds****. I had to turn to one of Paul Sanderson's maps to purvey the following information – one of the main pleasures in running this column is the way that readers use it as a forum for helping each other.*

To open the safe in the den in part one of ***American Suds*** *you must examine the painting and read the leaflet to discover the code. In part two, remove the loose bricks to uncover the stetson, then paint the hat black before wearing it.*

When you find yourself put into a pot in part three of the game, try eating the garlic. Also don't worry about being arrested for nudity in the final episode. Escape from the prison cell is a simple matter providing you are a jack of all trades.

Michael, of Hale in Cheshire, writes to ask for help in Larsoft's ***Hex****. According to David Noble's solution to the game – see what I mean about helping each other – you must wait until the trinket shop opens. Then ENTER SHOP, EXAMINE SHELF, EXAMINE URN, GET EARTH, LEAVE, DOWN, WEST and WASH EARTH. It is also a wise ploy to talk to the fisherman who you will find waiting outside the inn.*

Elsewhere Simon Gumley's problem in ***The Lost Crystal*** *is simply overcome if he continues to climb down the rope in the windmill.*

Nick Rapson asks an age old question concerning ***Twin Kingdom Valley****. He seems to be having difficulty with the dragon. I think you will find the wooden staff ideal for bashing all manner of nasties like witches and dragons, Nick. Len Hughes finds that drinking in the inn leaves him very weak. One drink is good for you, Len, but the secret is not to have too much.*

Meanwhile Nick Harrison is experiencing difficulties in another blast from the past, ***Sphinx Adventure****. The ogre should be killed with the sword. Don't worry about the weapon melting after this bout.*

The clumsy bear which seems to follow you everywhere will frighten the orc away and you will find the matches beyond the elephant. In the same game, Justin Anstey must retrieve the cheese from the goblins' dairy to catch the mouse.

Stephen Trumble is lost in the depths of the iron passages. You will need to adopt a drop and explore method if you are to map the maze, Stephen. This involves dropping a different object at each location to give each room a slightly different description. Try it and see.

Knights of the Round Table

This section is dedicated to experienced adventurers who offer their help and expertise to intrepid travellers who are stuck at various points in different adventures. Don't forget that if you write to one of my knights for help, please enclose a stamped self-addressed envelope.

Kneel and arise, Sir David Sheperdson, of 3 Tarn Villas, Cowpasture Road, Ilkley, West Yorkshire, LS29 8RH, who offers help with **Adventureland, Voodoo Castle, Impossible Mission, Pirate's Cove, Mystery Funhouse, Pyramid of Doom, Ghost Town, Robin of Sherwood, The Hulk, Spiderman, Golden Voyage, Golden Baton, Time Machine, Perseus and Andromeda, Arrow of Death** and **Sphinx Adventure.**

Kneel and arise, Sir Timothy Wye of Horseshoes, Lenham Road, Headcorn, TN27 9TU, who can assist with: **Kayleth, Golden Baton, Sphinx Adventure, Twin Kingdom Valley, The Hunt, Nine Dancers, Wychwood** and **The Puppet Man.**

sonal reply, please include a stamped self-addressed envelope to cover the cost of return postage.

The yuletide gossip will also speculate on the presents we may be exchanging after the feast. My own Christmas list includes Blood of the Mutineers, Blazing Star, Annabel Gray and Reluctant Hero, each of which I will surely be playing into the golden hours of next year – long after the last hangover has cleared.

Then the New Year will bring promised releases of Riverdale's latest howler, Aussie Suds, and Labyrinth's ominous Quest for the Pendragon, both of which I await with excited expectation.

I must give very warm thanks to Ray Bray of Cheadle Hulme, Cheshire, for his explicit solution and map to Golden Voyage. If you would like to send me a list of your adventures Ray, one of my pigeons will return a suitable reward. Thanks also to Paul Sanderson for a whole bag full of solutions, all of which will be added to my monumental tomes of reference which now encompass the whole of the top floor of this glorious castle.

The map this month concludes my series on mazes, and features a real twister from Oxbridge. I hope this helps some travellers stuck in this most perplexing game.

Many adventurers get stuck at the opening scenario to an adventure and give up too soon. Next month I will begin a series of maps of opening gambits which will hopefully put bewildered travellers on the right track. Next month's column will also feature the New Year Top 20 – watch this space.

● *That's it for this month, so until Santa becomes a myth, happy adventuring.*

Readers Hall of Fame

Dodgy Geezers – *Bill Zanzinger*

You start in a cell. Travel East then South until you meet Bulletproof George, who will give you a slip of paper. Go West to St. Judes Road, then North East to Pork Pie Parade. Continue North East to Electricity Street.

Go South into the Kaff and examine the paper. Phone 943-9999 and reply KEN when asked who you want. Journey North, East, East to the dog track and meet Tweedle. Things in Bags is the inside tip from Ken, so wait for the tip to win. Go West, West, North East, South, East and hang about, then go North into the Fish Finger pub at opening time. You will meet Tweedle again, who will hand over your winnings.

South, West, North then East will take you to the builder's yard where George is working. Hang about until the teabreak and get the pickaxe. Now journey West and drop both the money and the pickaxe.

Go South West, West into the Frog and Peach, then West again and get the box of matches. Examine the box before walking East, East, South East, South, North East and South into the warehouse. Examine the warehouse. A motor draws up, so you must hide. Listen to the conversation then lift the tarpaulin and examine the crates. Open the crates and get the nails. Go North, South West, North, North West and North East and get the money.

(To be continued next month)

Solved

*In **Enthar Seven** Neil Fawley can't understand the dwarf in the underground maze. It is something to do with a communication breakdown – try using the translator from the research centre.*

*In Robico's other classic, **Myorem**, Peter Davis is having problems leaving the mansion. Don't leave the house, but search for a secret passage through the fireplace to the garage. However, you will need to find some life saving artifacts before you attempt this.*

In the same game Ian Short is very wet in the ditch and seems to be getting nowhere in particular. You must try to build a raft from the oil drum, a lid and some vine. Then, holding firmly on to the drum, jump into the culvert.

*Robin Dixon appears to be floundering in the earlier **Saga of a Spy** adventures. You should read the messages you find and make a note of the anagrams and codes. A phone call will reveal very important information.*

*The newspaper in **Project Thesius** has stymied both James Donohue and Jatravartid Blob – that must be a pseudonym. James explains the problem as follows: The official hint sheet asks me to imagine the newspaper code as a clock face where the numbers represent directions: 12 is North and three is East. It then illogically goes on to say that therefore 3.15 would be East and 3.00 would be North East.*

The problem is not as illogical as it might first appear. The clockface represents the points of the compass so when both hands point towards the 12 they point North, both hands to the three they direct East and so on.

However, when one hand points to the 12 and the other to the three as in three o'clock you take the mean difference between them which lies between 1 and 2 on the clock face. Consequently you travel North East. Figure I hopefully shows this quite clearly.

*Finally in Melbourne House's spoof on social climbing, **Hampstead**, John Butterfield can start his ascendency by giving the lathe retaining bracket to the man on the train. But first make sure you get on the right train,*

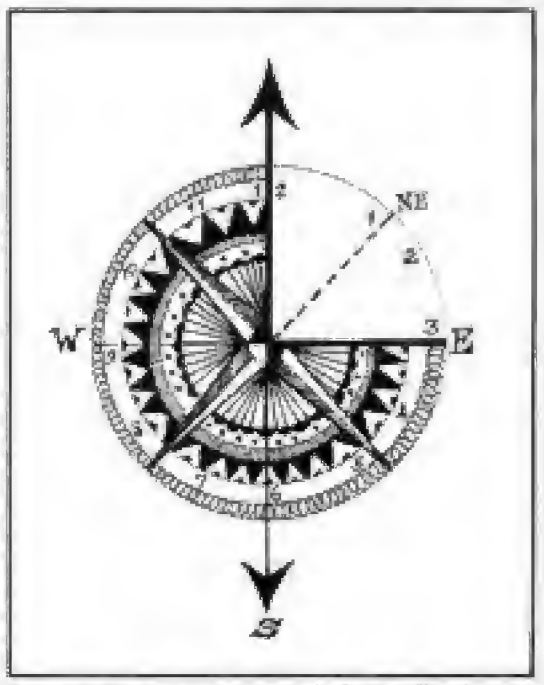
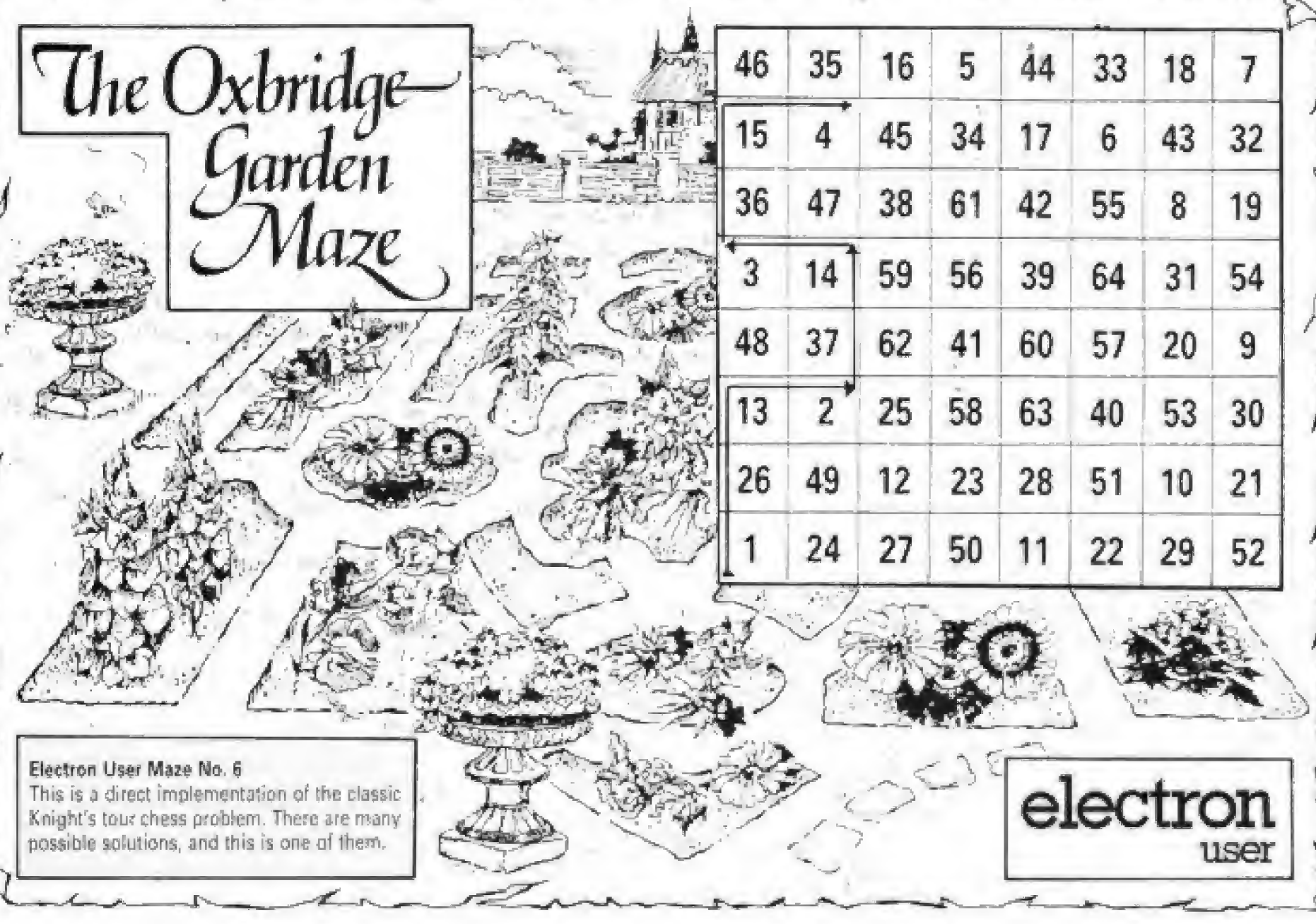


Figure I: The newspaper code in Project Thesius

John. Then use your stolen credit card to improve your image at the gentlemans' outfitters.

The Oxbridge Garden Maze



46	35	16	5	44	33	18	7
15	4	45	34	17	6	43	32
36	47	38	61	42	55	8	19
3	14	59	56	39	64	31	54
48	37	62	41	60	57	20	9
13	2	25	58	63	40	53	30
26	49	12	23	28	51	10	21
1	24	27	50	11	22	29	52

Electron User Maze No. 6
This is a direct implementation of the classic Knight's tour chess problem. There are many possible solutions, and this is one of them.

electron user

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Sheep can be a real trial

You won't have the wool pulled over your eyes when you play Steve Bissell's version of a classic arcade game

ONCE again it is time for the annual sheep dog trials to start. Farmers have gathered from miles around, and together with their faithful dogs they wait to demonstrate their skill. Crowds of spectators surrounding the arena are eagerly awaiting the outcome. Who will be this year's supreme champion?

You are a bit apprehensive this time, and have had to train hard – your old border collie, Bob, isn't as fast as he used to be. Pity, it wasn't all that long ago that he would have run rings around this flock with one leg tied behind his tail.

There's a knack to controlling sheep, if only he can remember it today. No time to worry about that now though, the start has just been announced. As usual it looks easy, and you, in control of the dog, must drive the sheep upwards through the bottom gate and left to right through the top gate, finally corralling them in the pen. Points are gained for each successful manoeuvre.

Sheep being the unpredictable creatures that they are, it's quite possible that they will run through a gate of their own accord. If this happens, you will be credited with the points automatically.

A time limit of eight minutes has been set, but the trial will be complete if you manage to pen all of the sheep within the time allotted. At the end you will be awarded 50 points for each sheep enclosed, plus a bonus for every second remaining on the clock.

Due to speed problems the program was originally written in two colour Mode 4. However, at the start of the program you will be asked if you are using a Turbo Driver. If so, typing Y will make the game run in four colour Mode 1.

PROCEDURES	
instructions	Print instructions and controls
init	Initialise game
screen	Draw screen
movedog	Move the dog
testsheep	Check for legal move
movesheep	Move sheep, check for score
score	Update score

```
10 REM Sheep Dog
20 REM By Steve Bissell
30 REM (c) Electron User
40 IF PAGE>&1100 GOTO 940
50 MODE1:*FX16
60 PROCinstructions
70 MODE M%
80 PROCinit
90 REPEAT
100 PROCscreen
110 TIME=0
120 REPEAT
130 T%=480-(TIME DIV 100)
140 PROCmovedog
150 PROCtestsheep
160 COLOUR 3:PRINTTAB(33,30);T%DIV60
; : ";T% MOD 60 ";
170 UNTIL P%>5 OR T%<1
180 PROCgameover
190 UNTIL INKEY-86
200 MODE 6:END
210 DEFPROCinstructions
220 VDU 23,1,0;0;0;0;
230 COLOUR 129:COLOUR 2:PRINTTAB(10,
0)STRING$(18," ")TAB(10,1)" Sheep Dog
Trials "TAB(10,2)STRING$(18," ")
```

CONTROLS	
Z	Left
X	Right
*	Up
?	Down

```
240 COLOUR 128:COLOUR 3:PRINTTAB(0,5
)"With your faithful border collie, yo
u"TAB(0,6)"have just 8 minutes in whic
h to drive"TAB(0,7)"some sheep around
a trials course."
250 COLOUR 2:PRINTTAB(0,9)"You score
 points when a sheep passes"TAB(0,10)"
upwards through the bottom gate, or fr
om"TAB(0,11)"left to right through the
 top gate."
260 COLOUR 1:PRINTTAB(0,13)"The tria
l ends if you successfully pen"TAB(0,1
4)"all of the sheep, or the time runs
out."
270 COLOUR3:PRINTTAB(0,16)"At the fi
nish you will be awarded - 50"TAB(0,17
)"Points for each sheep enclosed withi
n"TAB(0,18)"the pen. Plus, a time bonu
s."
280 COLOUR 130:COLOUR 0:PRINTTAB(2,2
0)" Remember, sheep are unpredictable.
 ":COLOUR 128:COLOUR 3:PRINTTAB(3,23)"
CONTROLS :  Z = left    X = right"TAB(
15,25)"* = up      ? = down"
290 COLOUR 131:COLOUR 0:PRINTTAB(0,2
8)"Are you using a Turbo Driver? ( Y o
r N )";
300 REPEAT:key=GET:UNTIL INKEY-69 OR
 INKEY-86
310 IF INKEY-69 M%=1:C%=2 ELSE M%=4:
C%=1
320 ENDPROC
330 DEFPROCinit
340 IF M%=1 VDU 19,2,2,0,0;
350 VDU 23,1,0;0;0;0;23,92,0,68,255,
68,68,255,68,68
360 VDU 23,91,196,71,71,124,124,124,
72,108,23,93,0,6,70,56,56,56,68,68
```

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VARIABLES	
A$(6),B$(28)	Screen data
S%(5,1)	X,Y coordinates of sheep
SX%,SY%	Temporary coordinates of sheep
X1%,Y1%	Movement of sheep
DX%,DY%	Coordinates of dog
H%,V%	Movement of dog
HI%	High score
YS%	Your score
P%	Sheep in pen
T%	Time

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```
  370 ENVELOPE 1,1,50,25,-40,2,4,0,126
,0,0,-126,126,126
  380 DIM A$(6),B$(28),S%(5,1):HI%=100
  390 RESTORE 850:FOR I%=0 TO 6:READ A
$(I%)
  400 J%=INSTR(A$(I%),".":IF J% A$(I%
)=LEFT$(A$(I%),J%-1)+" "+MID$(A$(I%),J
%+1):GOTO 400
  410 NEXT
  420 ENDPROC
  430 DEFPROCscreen
  440 CLS:COLOUR C%:Y%=0:RESTORE 920:
FOR I%=0 TO 28:READ N%
  450 B$(I%)=A$(N%):PRINTB$(I%);:NEXT
  460 COLOUR 3:RESTORE 930:FOR I%=0 TO
 5:READ S%,SY%:PRINTTAB(S%,SY%)"]":S
%(I%,0)=S%:S%(I%,1)=SY%:B$(SY%)=LEFT$
(B$(SY%),S%)+"]"+RIGHT$(B$(SY%),39-S%
):NEXT
  470 DX%=20:DY%=15:COLOUR 1:PRINTTAB(
DX%,DY%)CHR$(91);
  480 COLOUR 1:PRINTTAB(0,30)"SCORE ";
Y%:COLOUR C%:PRINTTAB(12,30)"HI SCORE
 ";HI%:COLOUR 3:PRINTTAB(28,30)"TIME 0
 : 0"
  490 ENDPROC
  500 DEF PROCmovedog
  510 PRINTTAB(DX%,DY%)" "
  520 REPEAT:HI=(INKEY-98 AND DX%>0)-(
INKEY-67 AND DX%<38):VI=(INKEY-73 AND
DY%>0)-(INKEY-105 AND DY%<27):UNTIL MI
D$(B$(DY%+VI),(DX%+HI%)+1,1)=" "
  530 DX%=DX%+HI:DY%=DY%+VI:COLOUR 1:P
RINTTAB(DX%,DY%)"[":IF RND(8)>.5 SOUND
 1,1,5,2
  540 ENDPROC
  550 DEF PROCresisheep
  560 P%=0
  570 FOR S=0 TO 5
  580 DSX%=ABS(S%(S,0)-DX%):DSY%=ABS(S
%(S,1)-DY%)
  590 LR%=SGN(S%(S,0)-DX%):UD%=SGN(S%(
S,1)-DY%)
  600 SX%=S%(S,0):SY%=S%(S,1):X1%=0:Y1
%=0
  610 IF LR%=0 AND UD%>0 AND DSX%<5 AN
D DSY%<5 X1%=RND(3)-2:Y1%=Y1%+1 ELSE I
F LR%=0 AND UD%<0 AND DSX%<5 AND DSY%<
5 X1%=RND(3)-2:Y1%=Y1%-1
  620 IF UD%=0 AND LR%>0 AND DSX%<5 AN
D DSY%<6 Y1%=RND(3)-2:X1%=X1%+1 ELSE I
F UD%=0 AND LR%<0 AND DSX%<5 AND DSY%<
6 Y1%=RND(3)-2:X1%=X1%-1
  630 IF DSX%>4 AND DSY%>2 X1%=RND(3)-
2:Y1%=RND(3)-2
  640 PROCmovesheep
  650 S%(S,0)=SX%:S%(S,1)=SY%
  660 NEXT
  670 ENDPROC
  680 DEFPROCmovesheep
  690 IF (SX%>19 AND SX%<33) AND (SY%>
17 AND SY%<24) P%=P%+1
  700 IF MID$(B$(SY%+Y1%),SX%+X1%+1,1)
=" " AND SX%+X1%>1 AND SX%+X1%<38 AND
SY%+Y1%>1 AND SY%+Y1%<27 ELSE ENDPROC
  710 IF (SX%>4 AND SX%<11) AND (SY%>1
4 AND SY%+Y1%<15) TY%=10:PROCscore
  720 IF (SY%>4 AND SY%<11) AND (SX%<2
8 AND SX%+X1%>27) TY%=10:PROCscore
  730 PRINTTAB(SX%,SY%)" ";:B$(SY%)=LE
FT$(B$(SY%),SX%)+" "+RIGHT$(B$(SY%),39
-SX%):SX%=SX%+X1%:SY%=SY%+Y1%:COLOUR 3
:PRINTTAB(SX%,SY%)"]";:B$(SY%)=LEFT$(B
$(SY%),SX%)+"]"+RIGHT$(B$(SY%),39-SX%)
  740 ENDPROC
  750 DEFPROCscore
  760 SOUND 1,1,100,5:YS%=YS%+TY%:COL
OUR 1:PRINTTAB(6,30);YS%
  770 ENDPROC
  780 DEFPROCgameover
  790 TY%=P%+50+T%+50:PROCscore
  800 FOR I%=1 TO 5:FOR J%=0 TO 100 ST
EP 10:SOUND 1,-15,J%,1:NEXT:NEXT
  810 FOR I%=0 TO 28:PRINT:SOUND 1,-15
,200-I%*5,1:NEXT:VDU 30:FOR I%=0 TO 28
:VDU ??:SOUND 1,-15,I%*6,1:NEXT:*FX21
  820 COLOUR 3:PRINTTAB(8,10)"G  A  M
E    O  V  E  R":COLOUR 1:PRINTTAB(P,
14)" A N O T H E R  G O ? "'COLOUR C%:
PRINTTAB(12,18)"( Y E S or N O )"
  830 key=GET:IF YS%>HI% HI%=YS%
  840 ENDPROC
  850 DATA \\\\\\\\\\\\\\\\\\\\\\\\\\\\
\\\\\\\\\\\\\\
  860 DATA \.....\
  870 DATA \.....\
  880 DATA \...\.....\.....
.....\
  890 DATA \.....\\\\\\\\
\\....\.....\
  900 DATA \.....\.....
.....\.....\
  910 DATA \.....,\\\\\\\\
\\\\\\\.....\
  920 DATA 0,1,1,1,2,1,1,1,1,1,1,2,1,1
,1,3,1,4,5,5,5,5,5,5,6,1,1,1,0
  930 DATA 5,19,9,20,6,22,8,24,3,25,13
,23
  940 *TAPE
  950 *KEY0 D%=PAGE-&E00:FOR I%=PAGE T
O TOP STEP 4:!(I%-D%)=!I%:NEXT:PAGE=&E
00:MOLD|MRUN|M
  960 *FX138,0,128
```


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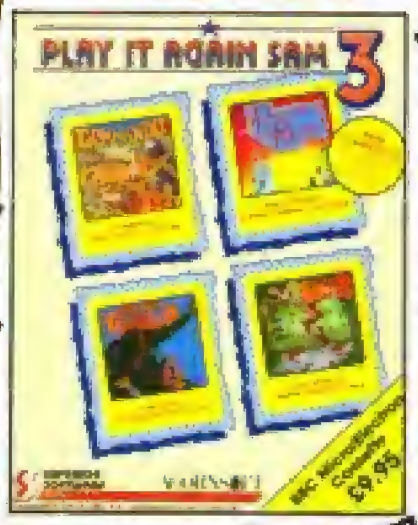

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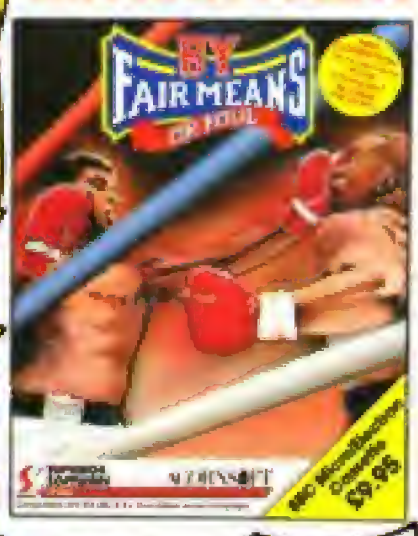

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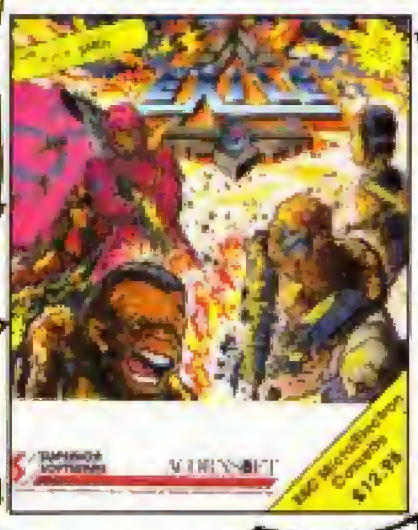

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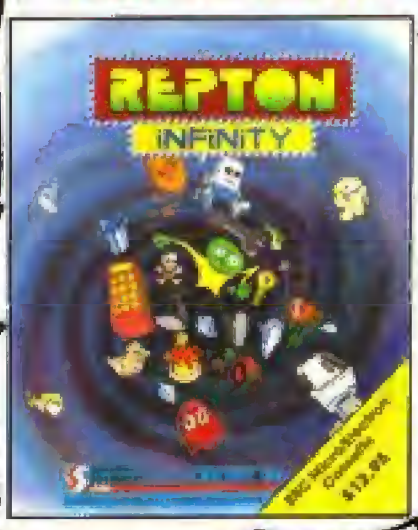

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